C 21.5: 966/5

Vol. 966 Number 5

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

January 31, 1978

RECEIVED
FEB 1 1978
DEPOSITORY
DOCUMENTS DEPARTMENT

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

January 31, 1978 Volume 966 Number 5

CONTENTS

	Page
Patent and Trademark Notices	
National Inventors Day	966 OG 110
Board of Appeals Decisions Rendered in the Month of December 1977	966 OG 110
Registration to Practice	966 OG 110
Patent Suits	966 OG 110
Patent Notices	
Certificates of Correction for the Week of January 31, 1978	966 OG 112
Disclaimers	966 OG 112
Errata	966 OG 112
Condition of Patent Applications	966 OG 113
Reissue Patents Granted (29,526)	1631
Plant Patents Granted (4,202)	1633
Patents Granted	
General and Mechanical (4,070,712)	1635
Chemical (4,071,312)	1835
Electrical (4,071,687)	1935
Design Patents Granted (247,071)	2015
Index of Patentees	PI 1
Indices of Reissues, Plants and Designs	PI 41
Classification of	
Patents (Including Reissues)	PI 43
Designs and Plants	PI 45
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 46
Designs and Plants	PI 47
Change of Address Form and Subscription Order Form	Back Page

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENTS SECTION), issued weekly, subscription $342.20 per annum for first class mailing, also available as fourth-class mail at $250.00; foreign mailing $85.55 additional; single copies $6.60 each.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly, subscription $88.40 per annum, foreign mailing $22.10 additional; single copies $1.70 each.

CIRCULARS OF GENERAL INFORMATION concerning PATENTS, price 60 cents each.

CIRCULARS OF GENERAL INFORMATION concerning TRADEMARKS, price 50 cents each.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at 50 cents each; PLANT PATENTS in color, $1.00 each; copies of TRADEMARKS AND DESIGN PATENTS at 20 cents each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

National Inventors Day

The Patent and Trademark Office will be sponsoring National Inventors Day in the Public Search Room on Saturday, February 11, from 1:00 p.m. to 5:00 p.m. and Sunday February 12, 1978 from 10:00 a.m. to 5:00 p.m. The public is invited to view the exhibits on these days and to attend a formal program at 2:00 p.m. on Sunday.

In order to accommodate the exhibits, it will be necessary to close the Public Search Room at 5:00 p.m. on Friday, February 10, 1978.

We would appreciate the cooperation of all users of the Search Room facilities in removing all personal items and belongings in order to permit the early closing time.

LUTRELLE F. PARKER,
Dec. 7, 1977 *Acting Commissioner of Patents and Trademarks.*

Board of Appeals Decisions Rendered in the Month of December 1977

Affirmed	120
Affirmed in part	16
Reversed	56
Total	192

Registration to Practice

The following are names of persons applying for registration to practice before the United States Patent and Trademark Office. Information tending to affect the eligibility of said applicants on moral, ethical, or other grounds, should be furnished the Commissioner of Patents and Trademarks on or before March 3, 1978.

Botz, Eugene G., R.R. 2, Co. Rd. 64, Auburn, Ind. 46706
Gallagher, Richard J., 1600 S. Eads St., #1107N, Arlington, Va. 22202
Lloyd, Nannellyn W., P.O. Box 3927, Wilmington, Del. 19807
Modance, Walter A., 2311 Washington Ave., Chevy Chase, Md. 20015
Sommer, Warren, 2608 N. Humboldt, Milwaukee, Wis. 53212

LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks and Chairman, Committee on Enrollment.

Jan. 8, 1978.

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,610,869, R. P. Allison, FLEXIBLE-HOSE END CONNECTION; **2,616,456,** N. E. Klein, SHUTTLE EYE; **2,657,960,** C. H. Latimer-Needham, PISTON; **2,692,102,** Cobham, Latimer-Needham, Smith and MacGregor, APPARATUS FOR TOWING AND REFUELING AIRCRAFT IN FLIGHT; **2,692,103,** Cobham, Latimer-Needham and MacGregor, APPARATUS FOR TOWING AND REFUELING AIRCRAFT IN FLIGHT; **2,716,527,** C. H. Latimer-Needham, APPARATUS FOR AIRCRAFT-REFUELING IN FLIGHT AND AIRCRAFT-TOWING; **2,728,590,** P. S. MacGregor, SELF-ENGAGING AND SELF-SEALING PIPE COUPLINGS, ESPECIALLY APPLICABLE TO FLIGHT REFUELING PURPOSES; **2,783,079,** R. F. Worlidge, SELF-ENGAGING AND SELF-SEALING PIPE COUPLINGS, ESPECIALLY APPLICABLE TO FLIGHT REFUELING PURPOSES, **2,788,243,** Goodliffe and MacGregor, HOSE-REELS WITH MEANS FOR JETTISONING THE HOSE AND SEALING THE HOSE CONNECTION; **2,852,280,** R. F. Worlidge, SELF-ENGAGING AND SELF-SEALING PIPE COUPLINGS, ESPECIALLY APPLICABLE TO FLIGHT REFUELING PURPOSES, **2,855,223,** P. S. MacGregor, same; **2,887,297,** MacGregor, and Goodliffe, HOSE OR CABLE-CARRYING WINCHES; **2,904,351,** Gellett, MacGregor and Upton, PIPE-COUPLING DEVICES; **2,905,407,** MacGregor and Goodliffe, DEVICE FOR RESILIENTLY ARRESTING THE MOVEMENT OF HOSE OR CABLE-CARRYING WINCHES; **2,953,332,** Cobham, Latimer-Needham, Smith and MacGregor, APPARATUS FOR TOWING AND REFUELING AIRCRAFT IN FLIGHT; **2,973,163,** Goodliffe, MacGregor and Procter, APPARATUS FOR TRAILING A FLUID-TRANSMITTING HOSE OR TOW-LINE FROM AN AIRCRAFT, **filed** Apr. 28, 1976, United States Court of Claims (District of Columbia), Doc. 169–76, *Flight Refueling Ltd.* v. *The United States.* Order, judgment is entered for the plaintiff, Aug. 19, 1977.

2,616,456. (See 2,610,869.)
2,657,960. (See 2,610,869.)
2,692,102. (See 2,610,869.)
2,692,103. (See 2,610,869.)
2,716,527. (See 2,610,869.)
2,728,590. (See 2,610,869.)
2,783,079. (See 2,610,869.)
2,788,243. (See 2,610,869.)
2,852,280. (See 2,610,869.)
2,855,223. (See 2,610,869.)
2,887,297. (See 2,610,869.)
2,904,351. (See 2,610,869.)
2,905,407. (See 2,610,869.)
2,953,332. (See 2,610,869.)
2,973,163. (See 2,610,869.)

3,030,744, A. E. Mueller, AIR FILM BEARING FOR MACHINE TOOLS, **filed** Nov. 14, 1973, D.C., N.D. Ill. (Chicago), Doc. 73c2896, *Harig Products, Inc.* v. *K. O. Lee Co., Atherton Machinery & Equipment Corp., Balko Tool & Machine Co. and F.J.M. Corp.* Judgment entered in favor of the defendants and against plaintiff, Aug. 18, 1977.

3,175,317, R. J. Slavsky, IDENTIFICATION TAG, **filed** May 13, 1976, D.C. (District of Columbia), Doc. 76–0831, *Godfrey Bloch* v. *C. Marshall Dann et al.* Order denying plaintiff's motion for reconsideration of order on July 16, 1976, Dec. 10, 1976.

3,220,960, Wichterle and Lim, CROSS-LINKED HYDROPHILIC POLYMERS AND ARTICLES MADE THEREFROM; **3,361,858,** O. Wichterle. RESHAPING A XEROGEL BY MECHANICAL REMOVING AND SWELLING TO FORM A HYDROGEL CONTACT LENS; **3,822,089,** same, CONTACT LENS BLANK OR REPLICA MADE FROM ANHYDROUS SPARINGLY CROSS-LINKED HYDROPHILIC COPOLYMERS; **Re. 27,401,** Wichterle and Lim, CROSS-LINKED HYDROPHILIC POLYMERS AND ARTICLES MADE THEREFROM, **filed** Jan. 17, 1977, D.C., N.D. Ill. (Chicago), Doc. 77c172, *National Patent Development Corp. and Flexible Contact Lens (Nevada), Inc.* v. *Continuous Curve Contact Lenses, Inc., Soft Lenses, Inc. and House of Vision, Inc.*

3,202,117, Bryant and Johnston, COAXIAL CONNECTOR WITH MEANS FOR PREVENTING AXIAL AND ROTATIONAL MOVEMENT BETWEEN CONNECTOR COMPONENTS, **filed** Aug. 11, 1977, United States Court of Claims (District of Columbia), Doc. 416–77, *Omni-Spectra, Inc.* v. *The United States of America.*

3,208,030, Lewis and Brown, Jr., ELECTRICALLY OPERATED CHARACTER PRINTER, **filed** Aug. 23, 1977, D.C., N.D. Ill. (Chicago), Doc. 77c3123, *A. B. Dick Company and Gould Inc.* v. *Recognition Equipment Inc.*

3,361,858. (See 3,220,960.)

3,754,309, Jones and Barkley, CUTTING INSERT AND CLAMPING ARRANGEMENT THEREFOR, **filed** Aug. 18, 1977, D.C., C.D. Calif. (Los Angeles), Doc. CV77–3128–ALS, *Kennametal Inc.* v. *The Kelley-Western Corp. and Irl L. Brossman.*

3,814,725, Zimmerman and Isaacson, POLYALKYLENE TEREPHTHALATE MOLDING RESIN, **filed** June 6, 1975, D.C., S.D. Ind. (Evansville), Doc. EV75–75–C, *Celanese Corporation* v. *General Electric Company.* Case dismissed, Apr. 19, 1977.

3,822,089. (See 3,220,960.)

3,937,167, W. H. Warren, METHOD FOR UNLOADING AND TRANSFERRING EGGS, filed July 20, 1976, D.C., C.D. Calif. (Los Angeles), Doc. CV76–2312–RMT, *Henningsen Foods, Inc.* v. *Food Engineering Service et al.* Filed stipulation and order that action is dismissed with prejudice except that the affirmative defenses and counterclaims of defendants against plaintiff seeking declarations of the invalidity and unenforceability of said patent are dismissed without prejudice, entered Aug. 26, 1977.

3,942,632, R. S. Witkoff, JEWELRY BOX, filed Aug. 22, 1977, D.C., E.D. N.Y. (Brooklyn), Doc. 77–C–1709, *The Alsten Company* v. *Jewelry Box Corp. of America and Harvey Hoff.*

3,961,454, H. C. Adams, PREFABRICATED INSULATION PANEL, filed Dec. 22, 1976, D.C., M.D. Fla. (Tampa), Doc. 76–1003–C.T.H., *Howard C. Adams and Global Lagging Inc.* v. *Anco Incorporated, Container Corporation of America and Koppers Co.* Complaint and counterclaims dismissed with prejudice, Sept. 8, 1977.

Re. 27,401. (See 3,220,960.)

Re. 28,861, S. Hall, Jr., SAFETY MEDICINE BOTTLE CLOSURE, filed Dec. 13, 1976, D.C., W.D. Okla. (Oklahoma City), Doc. 76–1011–D, *Plastic Container Corporation* v. *Continental Plastics of Oklahoma, Inc.* Defendant's motion for summary judgment granted and plaintiff's complaint is dismissed, and judgment is entered in favor of defendant, Aug. 5, 1977.

D. 198,760, L. T. Harris, RIVETLESS CHAIN LINK, filed Jan. 20, 1975, D.C., S.D. W. Va. (Charleston), Doc. 75–0010BK, *Protec, Inc.* v. *Janes Manufacturing, Inc. and Cooke-Wilson Electric Supply Company.* Janes Manufacturing was dismissed from action on Nov. 3, 1975 and Cooke-Wilson Electric Supply Company was dismissed on Aug. 25, 1977.

D. 218,999, Ross and Wilkens, BICYCLE FRAME, filed July 7, 1977, D.C., S.D. N.Y., Doc. 77–C–3311, *Chain Bike Corporation* v. *S.S.T. Trade & Development et al.*

PATENT NOTICES

Certificates of Correction for the Week of Jan. 31, 1978

P.P. 4,117	4,008,247	4,042,020	4,049,861
P.P. 4,118	4,013,762	4,042,671	4,049,935
Re 29,375	4,014,730	4,043,254	4,049,987
3,695,363	4,024,247	4,044,994	4,050,222
3,792,758	4,024,889	4,045,221	4,050,275
3,845,876	4,026,669	4,046,066	4,050,328
3,875,225	4,028,964	4,046,827	4,050,869
3,887,914	4,030,026	4,046,936	4,051,173
3,898,857	4,032,978	4,046,980	4,051,188
3,929,270	4,033,127	4,047,293	4,051,565
3,961,061	4,033,513	4,048,100	4,051,633
3,977,941	4,036,947	4,048,105	4,051,745
3,978,192	4,039,233	4,048,554	4,051,751
3,986,933	4,039,678	4,049,412	4,052,245
3,989,825	4,040,699	4,049,464	4,052,675
3,993,648	4,040,978	4,049,539	4,052,883
4,001,441	4,041,045	4,049,640	4,054,008
4,004,317	4,041,510	4,049,646	4,054,318
4,006,251	4,041,655	4,049,669	4,054,413

Disclaimer

3,834,143.—*Carlo Menegatto,* Monza, Italy. SPINDLE UNIT FOR TEXTILE MACHINE. Patent dated Sept. 10, 1974. Disclaimer filed Nov. 7, 1977, by the inventor.

Hereby enters this disclaimer to claims 1, 2, 6 and 7 of said patent.

Errata

All reference to Patent No. 4,067,236 to Gary L. Frederick of the United States for Mass Flow Sensor and Method appearing in the OFFICIAL GAZETTE of January 10, 1978 should be deleted since no patent was granted.

All reference to Patent No. 4,067,281 to James H. Files of Louisiana and John M. Montague and Charles T. Thomerson of Texas for Protective Marine Structures appearing in the OFFICIAL GAZETTE of January 10, 1978 should be deleted since no patent was granted.

All reference to Patent No. 4,069,210 to Leonard Evans James of the United States for Preparation of Polymeric Polyesters Using Certain Titanium Compounds as Combined Esterification-Polymerization Catalysts appearing in the OFFICIAL GAZETTE of January 17, 1978 should be deleted since no patent was granted.

In the OFFICIAL GAZETTE of August 16, 1977, vol. 961, p. 13, cancellation of entry of disclaimer re Patent No. 3,834,143 granted September 10, 1974 to Carlo Menegatto of Monza, Italy.

In the OFFICIAL GAZETTE of December 13, 1977, vol. 965, p. 10, delete Patent No. 3,887,914.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JANUARY 14, 1978

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	5-9-77
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	2-11-77
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	7-14-77
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	1-10-77
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	3-7-77
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	9-13-76
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	8-2-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	2-7-77
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	5-20-77
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	9-3-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	5-6-76
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	1-3-77
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	4-4-77
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	1-3-77
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	1-6-77
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	4-22-77

Expiration of patents: The patents within the range of numbers indicated below expire during January 1978, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,966,681 to 2,970,312, inclusive

Plant Patents..... Numbers 2,009 to 2,018, inclusive

PATENT EXAMINING CORPS

THE HONORABLE TED STEVENS, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JANUARY 16, 1975

PATENT EXAMINING GROUPS

	Applications Awaiting Action	Applications Being Examined	Applications Allowed	Applications Pending Appeal	Average Pendency (Months)
CHEMICAL EXAMINING GROUPS					
GENERAL CHEMISTRY AND METALLURGY (GROUPS 10-A, C, N) CLARENCE, Director					6-6-75
GENERAL ORGANIC CHEMISTRY (GROUP 10-B) LEVITT, Director					6-6-75
HIGH POLYMER CHEMISTRY, PLASTICS AND WOODPULP (GROUP 10-A, F) KENT, Director					6-6-75
COATING AND LAMINATING, BREAKDOWN, TREATMENT AND CONSERVATION (GROUP 10-C) BURNHAM, Director					6-6-75
SPECIALIZED CHEMICAL PROCESSES AND CHEMICAL ENGINEERING (GROUP 10-D, E) VINCENT, Director					6-6-75
ELECTRICAL EXAMINING GROUPS					
INDUSTRIAL ELECTRONICS, CONTROL SYSTEMS AND MEASURING INSTRUMENTS (GROUPS 35-C, 35-A) CLARENCE, Director					6-6-75
SPECIAL LAWS ADMINISTRATION (GROUP 35-C) D. CLARENCE, Director					6-6-75
INFORMATION TRANSMISSION SYSTEMS AND RETRIEVAL (GROUP 35-A) CLARENCE, Director					6-6-75
RECTIFICATION, AMPLIFICATION AND OSCILLATION (GROUP 35-B) CLARENCE, Director					6-6-75
ELECTRONIC COMPONENT SYSTEMS AND UTILITIES (GROUP 35-D) CLARENCE, Director					6-6-75
MECHANICAL EXAMINING GROUPS					
GRINDING, GROUP 30-C, D, CLARENCE, Director					6-6-75
MATERIAL HANDLING AND TREATMENT (GROUP 30-A, B) CLARENCE, Director					6-6-75
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS (GROUP 30-E, F, G) CLARENCE, Director					6-6-75
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION (GROUP 35-C, D, M, PUBLICITY) CLARENCE, Director					6-6-75
HEAT, POWER, AND FLUID ENDOWERING (GROUP 30-H, K, GAY, Director					6-6-75
MECHANICAL CONVEYORS, TEXTILES AND MINING (GROUP 30-J, M, NEWELL, Director					6-6-75

Suspension of practice. The Patent Office may refuse to recognize individuals before the Patent Office, and may suspend or exclude them from further practice before the Patent Office, upon proof that they are guilty of gross misconduct or violation of the Patent Office Code of Professional Responsibility. 35 U.S.C. 32. The Office publishes notices of suspensions and exclusions in the Official Gazette. Any person excluded or suspended from practice before the Patent Office may petition for reinstatement after the expiration of one year from the date of his exclusion or suspension. 37 C.F.R. 1.348.

Patents ..... Number 3,858,000 to 3,859,000 inclusive
Prints Patents ..... Numbers 3,858,000 to 3,859,000 inclusive

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,526

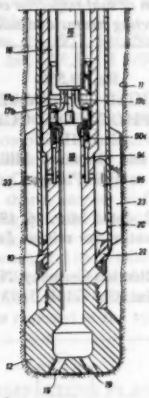
DIRECTIONAL DRILLING APPARATUS

John D. Jeter, 5952 Royal Lane, Suite 254, Dallas, Tex. 75230

Original No. 3,637,032, dated Jan. 25, 1972, Ser. No. 4,943, Jan. 22, 1970. Continuation-in-part of Ser. No. 869,056, Oct. 24, 1969, abandoned. Application for reissue Jan. 22, 1974, Ser. No. 435,413

Int. Cl.[2] E21B 7/06

U.S. Cl. 175—73 26 Claims



26. Apparatus for directionally drilling a well bore comprising a drill string extending into the well bore, a drill bit, means connecting the drill bit to the drill string to transmit rotation of the drill string to the drill bit and to allow limited universal pivotal movement of the bit around an axis perpendicular to the longitudinal axis of the drill string, including a bit sub having an upper portion extending above the universal connection into the drill string, means for sensing the inclination of the drill string adjacent the bit, and means responsive to the sensing means for urging the bit to pivot in the desired direction around said axis to change the direction of the well bore, said urging means including a piston mounted in the drill string adjacent the upper portion of the bit sub for rotation relative to the drill string and for axial movement along the longitudinal axis of the drill string toward and away from said upper portion for rotation relative thereto, a cam follower connected to the swivel member, a cam surface on the piston engaging the cam follower to pivot the sub and bit around said axis when the piston is moved axially along the longitudinal axis of the drill string, and means responsive to the sensing means to position the piston to pivot the sub and bit in the desired direction and to move the piston to so pivot the sub and bit.

Re. 29,527

SAFETY FOR FASTENER DRIVING TOOL

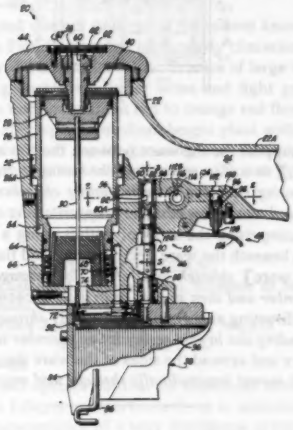
Howard B. Ramspeck, Elmhurst, and Allen R. Obergfell, Park Ridge, both of Ill., assignors to Duo Fast Corporation, Franklin Park, Ill.

Original No. 3,677,456, dated July 18, 1972, Ser. No. 55,178, July 15, 1970. Application for reissue July 17, 1974, Ser. No. 489,395

Int. Cl.[2] B27F 7/22

U.S. Cl. 227—8 22 Claims

20. A fastener driving device including a portable housing, fluid pressure operated fastener driving means carried by said housing for movement through successive cycles of operation each of which includes a fastener driving stroke and a return stroke, fastener magazine means carried by said housing for receiving a supply of fasteners and feeding successive fasteners into a position to be driven into a workpiece during successive fastener driving strokes of said fastener driving means, fluid pressure control means including an actuating member carried by said housing for movement from a normal inoperative position into an operative position for initiating the movement of said fastener driving means through a fastener driving stroke, a work contact responsive member carried by said housing for movement from a normal inoperative position into an operative position in response to the movement of said device into cooperating engagement with a workpiece, and a trigger member carried by said housing for manual movement from a normal inoperative position into an operative position, the



improvement in combination therewith which comprises enabling means operatively associated with said members for (1) enabling movement of said trigger member into its operative position when said work contact responsive member is in its inoperative position without movement of said actuating member into its operative position, (2) enabling movement of said trigger member into its operative position when said work contact responsive member is in its operative position to effect movement of said actuating member into its operative position, and (3) enabling movement of said work contact responsive member into its operative position when said trigger member is in its operative position without movement of said actuating member into its operative position.

Re. 29,528

JET FIRED ZONAL LEHR FOR APPLYING TREATING MEDIUM INSIDE AND OUTSIDE OF GLASS CONTAINERS SIMULTANEOUSLY

Edward W. Bowman, deceased, late of Uniontown, Pa. (by Muriel B. Bowman, co-executor), assignor to E. W. Bowman, Incorporated, Uniontown, Pa.

Original No. 3,754,885, dated Aug. 28, 1973, Ser. No. 1,97,,302, Nov. 10, 1971. Application for reissue July 9, 1976, Ser. No. 704,090

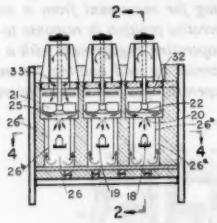
Int. Cl.[2] C03B 25/04

U.S. Cl. 65—119 8 Claims

1. A glass annealing lehr for treating hollow glassware such as bottles and the like, which consists of a tunnel having undivided separately controllable temperature zones, longitudinally of said tunnel and having superposed treating, recirculating and firing chambers vertically of said tunnel, a conveyor for supporting and passing the products to be annealed through

said treating [chambers] *chamber,* and a fan mounted for delivering the convective treating medium to the recirculating chamber under pressure, said recirculating chamber [having an opening] *being formed with a longitudinally extending slot* aligned over the ware supported on said conveyor for jetting the treating medium into the mouth and simultaneously around the outside wall of the ware supported on said conveyor[.], *and return flow passages at the sides of said treating chamber for drawing the treating gases therefrom for return to said fan.*

5. In the method of annealing *open top* glassware such as bottles and the like [in a tunnel shaped treating chamber



having a support for the ware between the top and bottom of the tunnel,] *in a glass annealing lehr having in superposed relation, a treating chamber, a recirculating chamber and a firing chamber, and return flow passages at opposite sides of said treating chamber, comprising* the steps of withdrawing a heat treating fluid from beneath the ware, recirculating said fluid [to a zone over said ware] *through said return flow passages first to said firing chamber and then to said recirculating chamber,* and *continuously* directing said fluid downwardly *through a longitudinally extending slot in said recirculating chamber* into the mouth of the ware and around the sides of the ware simultaneously *as the ware is moved longitudinally through said treating chamber.*

Re. 29,529

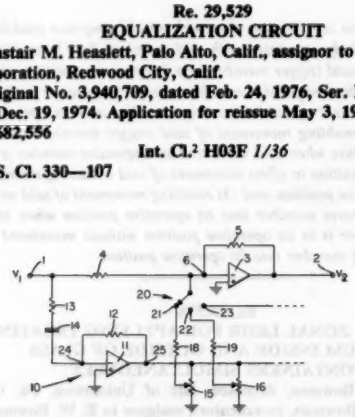
EQUALIZATION CIRCUIT

Alastair M. Heaslett, Palo Alto, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Original No. 3,940,709, dated Feb. 24, 1976, Ser. No. 534,357, Dec. 19, 1974. Application for reissue May 3, 1976, Ser. No. 682,556

Int. Cl.[2] H03F 1/36

U.S. Cl. 330—107 **21 Claims**



14. An equalization circuit, comprising:

a. an input terminal for receiving an input signal to be equalized;

b. a first amplifying means having an input and an output;

c. a first means for connecting said first amplifying means to said input terminal and providing an output signal which is substantially in phase with said input signal;

d. a phase shift circuit means coupled to said input terminal and providing an output signal having an increasing amplitude and constant phase lag with frequency relative to said input signal, within a predetermined frequency range of said input signal;

e. a second means for connecting the output of said phase shift circuit means to said input of said first amplifying means; and

f. said first amplifying means providing an output signal representative of the sum of said respective output signals provided by said first connecting means and said phase shift means.

Re. 29,530

MAGNETO-OPTICAL INFORMATION STORAGE DEVICE USING PHOTOCONDUCTIVE CONTROL ELEMENT

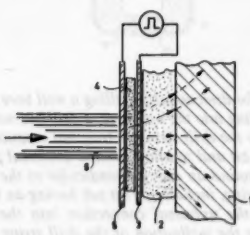
Jens-Peter Krumme, and Bernhard Hill, both of Hamburg, Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Original No. 3,944,992, dated Mar. 16, 1976, Ser. No. 520,533, Nov. 4, 1974. Application for reissue Jan. 17, 1977, Ser. No. 759,680

Claims priority, application Germany, Nov. 16, 1973, 2357301

Int. Cl.[2] G11B 5/02

U.S. Cl. 365—122 **10 Claims**



1. [An] *In an* information storage *and retrieval* device comprising [a] *an information* storage plate of [a magnetizable] *magneto-optic* material, [means including a light beam] *means for heating selected area of said storage plate, means to produce a magnetic field to effect storage within one of the heated areas of a value represented by one of two stable orientations, and means utilizing a magneto-optical effect* for [recording and] retrieving information [in] *from* said storage plate, *the improvement comprising* a photoconductive layer on the magneto-optic material of the storage plate, and electrode means on said photoconductive layer, *said heating means including the combination of optical means for positioning a spot of activating radiation on said photoconductive layer whereby a selected area of said photoconductive layer is rendered electrically conductive,* said electrode means being connected to an electrical power source [to heat said layer] *whereby a current can flow within said selected area and thermal energy is dissipated in said area which heats an adjacent area of the storage plate .*

PLANT PATENTS

GRANTED JANUARY 31, 1978

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,202

IMPATIENS PLANT

James C. Mikkelsen, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Jan. 31, 1977, Ser. No. 764,023
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of Impatiens known by the cultivar name Lafayette and particularly characterized as to uniqueness by the combined characteristics of semi-compact growth habit that breaks well after the removal of the apical tip; internode spacing which provides excellent exposure to foliage and flowers; sharp, narrow leaf variegation, with the variegation developing quickly; deep orange-red flower color and profuse flowering; a spur which is curved and the same color as the flower petals, and its five flower petals, the top one of which is separated from the other four with its apex nearly pointed, and the bottom two of which are largest in diameter and have their apices recessed at the vein.

4,203

IMPATIENS PLANT

James C. Mikkelsen, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Jan. 31, 1977, Ser. No. 764,024
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of Impatiens known by the cultivar name Preamble and particularly characterized as to uniqueness by the combined characteristic of narrow, long and variegated foliage; rose pink flower color; symmetrically round flower shape, with each flower petal being nearly the same size; superior durability; produces substantial side growth thereby permitting adequate cuttings to be taken for commercial production, and by its general plant growth which is ideal for pot plant culture.

4,204

IMPATIENS PLANT

James C. Mikkelsen, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Jan. 31, 1977, Ser. No. 764,525
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of Impatiens known by the cultivar name Paul Revere and particularly characterized as to uniqueness by the combined characteristics of large variegated foliage having dark green outer areas and light green inner areas near the midrib; medium red to orange red flowers up to 6 cm. in diameter; upright medium height plant with good self branching habits and by its growing and flowering in full sunlight outdoors without deterioration of flower or the variegated foliage.

4,205

IMPATIENS PLANT

James C. Mikkelsen, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Jan. 31, 1977, Ser. No. 764,531
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of Impatiens known by the cultivar name Liberty and particularly as to uniqueness by the combined characteristics of a very floriferous appearance due to the terminal whorl of leaves developing close to the previous node and branching frequently at several nodes on the same stem; the top and bottom petals having a nearly white throat at the base; relatively wide and variegated leaves; generally pink flower color and above average flower size; strong, rigid growth which develops an arching, flowering pattern; ease of propagation in quantity, and preferred growth in a very lightly shaded environment.

PATENTS

GRANTED JANUARY 31, 1978

ERRATA

For CLASS	See PATENT NO.
052–125	4,070,832
052–148	4,070,833
052–166	4,070,834
052–235	4,070,835
052–245	4,070,836
052–297	4,070,837
052–400	4,070,838
052–448	4,070,839
052–489	4,070,840
052–506	4,070,841
053–508	4,070,842
052–521	4,070,843
052–584	4,070,844
053–632	4,070,845
052–641	4,070,846
052–650	4,070,847
052–707	4,070,848
052–742	4,070,849
053–048	4,070,850
053–228	4,070,851
053–297	4,070,852
053–373	4,070,853
053–381 A	4,070,854
074–475	4,070,914
123–198 A	4,070,971
137–317	4,071,011
137–321	4,071,012
292–246	4,071,129
336–172	4,071,167
336–064	4,071,226
366–064	4,071,226
427–185	4,071,304
072–329	4,071,360
364–105	4,071,744
364–104	4,071,745
252–392	4,071,746
362–127	4,071,747
362–019	4,071,748
362–020	4,071,749
362–217	4,071,750
363–080	4,071,812
365–065	4,071,841

PATENTS

GRANTED JANUARY 31, 1978

ERRATA

Re- CLASS	Re- PATENT NO.
052-125	4,070,812
052-148	4,070,833
052-150	4,070,834
052-232	4,070,835
052-262	4,070,836
052-267	4,070,837
052-460	4,070,838
052-468	4,070,839
052-489	4,070,840
052-506	4,070,841
052-508	4,070,842
052-521	4,070,843
052-584	4,070,844
052-632	4,070,845
052-641	4,070,846
052-650	4,070,847
052-707	4,070,848
052-743	4,070,849
052-944	4,070,850
052-958	4,070,851
052-967	4,070,852
052-977	4,070,853
053-A61 A	4,070,854
054-A12	4,070,914
123-198 A	4,070,971
137-317	4,071,011
137-321	4,071,012
292-246	4,071,129
336-122	4,071,167
336-D64	4,071,224
366-D04	4,071,225
427-185	4,071,304
072-129	4,071,360
364-102	4,071,744
364-104	4,071,745
232-292	4,071,748
362-127	4,071,767
362-D19	4,071,768
362-D20	4,071,769
362-217	4,071,780
363-080	4,071,812
365-D05	4,071,841

PATENTS

GRANTED JANUARY 31, 1978

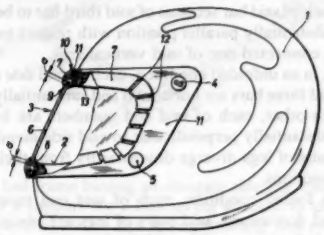
GENERAL AND MECHANICAL

4,070,712

CLEAR WINDOW FOR PROTECTIVE HELMETS

Hans-Günther v. d. Marwitz, Munich, Germany, assignor to Bayerische Motoren Werke Aktiengesellschaft, Germany

Filed Sept. 16, 1976, Ser. No. 723,969
Claims priority, application Germany, Sept. 17, 1975, 2541468
Int. Cl.[2] A61F 9/04; A42B 3/00
U.S. Cl. 2—10 **31 Claims**



1. A window shield for protective helmets, especially for the users of motor vehicles, which includes a window aperture provided in the helmet and window means made of laminated glass which extends substantially over the entire field of vision of the window shield, characterized in that the window means is mounted within an elastic mounting support means which abuts at the edge area of the window aperture provided in the protective helmet so that the window means overlaps the edge area of the window aperture, and frame means joined to said support and detachably connecting said window means to said helmet.

4,070,713

MEDICAL GLOVE AND METHOD

Glenn Francis Stockum, Arlington, Tex., assignor to Arbrook, Inc., Arlington, Tex.

Filed Mar. 17, 1976, Ser. No. 667,790
Int. Cl.[2] A41D 19/00
U.S. Cl. 2—168 **4 Claims**

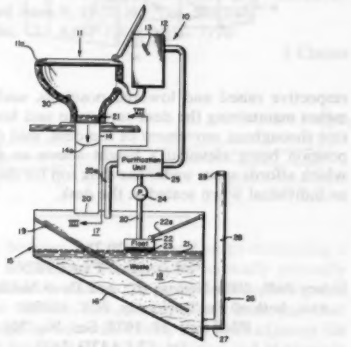
1. A medical glove adapted to tightly conform to the skin of a wearer's hand and to be donned without the use of additional lubricants, comprising: an outer layer of elastomeric material; an inner layer of elastomeric material comprising as a major component thereof carboxylated styrene butadiene latex bonded to said outer layer; and corn starch particles securely embedded in and randomly distributed throughout said inner layer, at least a portion of said particles having a size greater than the thickness of said inner layer and at least a portion of said particles being partially exposed on the inner, skin-contacting surface of said inner layer to form a lubricating means for aiding in the donning of said glove.

4,070,714

SEWERLESS RECIRCULATING TOILET AND HUMAN WASTE STORAGE SYSTEM

Norris J. Bishton, Jr., Santa Monica; Robert L. Rod, Marina Del Rey; Bruce Wagenhals, Fountain Valley; Theodore M. Woltanski, Hawthorne, and John S. Blick, III, Laguna Beach, all of Calif., assignors to Monogram Industries, Inc., Santa Monica, Calif.

Filed Feb. 27, 1974, Ser. No. 446,294
Int. Cl.[2] E03D 5/016; B01D 37/00
U.S. Cl. 4—318 **21 Claims**



9. In a sewerless recirculating toilet and human waste products storage system, having a commode with a flushing fluid of a specific gravity less than water associated therewith, a trap controlled waste products and flushing fluid outlet leading from said commode to a waste products and flushing fluid separation space, a storage space for the separated human waste products, the improvement which comprises:

fluid and human waste storage means operatively connected to said outlet for receiving said mixture of human waste products and said flushing fluid, separating said flushing fluid from said human waste products, storing said human waste products for an indefinite period of time in a state of suspended animation by maintaining said layer of flushing fluid in sealing contact with said human waste products until said flushing fluid cuts off substantially all oxygen from said human waste products thereby stopping aerobic bacterial action in said human waste products, and continuing to maintain said layer of flushing fluid in sealing contact with said human waste products until the pH of said human waste products reaches a level at which anaerobic bacterial action in said human waste products virtually ceases, so that said flushing fluid is stored on top of said human waste products and a portion of said stored flushing fluid may be recycled back into said commode, when desired.

4,070,715

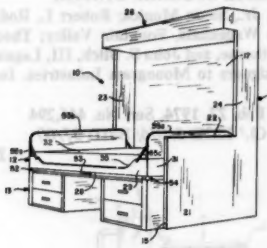
COMBINATION BED AND DESK

George S. Reppas, 1030 San Raymundo Road, Hillsborough, Calif. 94010

Filed Sept. 29, 1976, Ser. No. 727,780
Int. Cl.[2] A47C 13/18
U.S. Cl. 5—2 R **11 Claims**

1. Combination bed and desk furniture comprising a bed frame for holding bedding, means for carrying the frame at one of its ends for pivotal movement about a transverse axis between a raised position in which the frame and bedding are disposed in an upright orientation and a lowered position in

which the frame and bedding are disposed in a horizontal orientation, a desk having a top surface disposed in a generally horizontal orientation, means for mounting the desk for movement with the bed between a raised position and a lowered position concurrent with movement of the bed between its



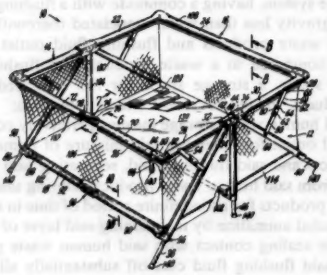
respective raised and lowered positions, said last mentioned means maintaining the desk surface in said horizontal orientation throughout movement of the desk, said desk in its raised position being elevated a height above an underlying floor which affords space under the desk top for the legs and feet of an individual when seated at the desk.

4,070,716

FOLDABLE PLAYPEN

Henry Satt, 1006 Neilson St., and Dave Neuberg, 833 Central Ave., both of Far Rockaway, N.Y. 11691

Filed July 19, 1976, Ser. No. 706,925
Int. Cl.[2] A47D *7/00*
U.S. Cl. 5—99 C **15 Claims**



1. A foldable playpen comprising:

an upper frame including two end members and two side members;

each end member including two end sections hingedly interconnected to each other at their respective inner ends to provide junctions;

two pairs of legs, each pair having its upper ends hingedly interconnected with a respective one of said end members at said junction;

two vertical legs, each having its upper end fixedly interconnected to a respective one of said end members at said junction;

each side member including two side sections and first hinge means interconnecting said two side sections to each other at their inner ends for permitting said two side sections to be pivoted inward towards each other into a substantially parallel position with respect to each other, second hinge means interconnecting outer ends of said two side sections to outer ends of said end sections for permitting each of said two side sections to be pivoted to a substantially parallel position with respect to an associated connected one of said end sections;

three bars, each bar including two bar sections and third hinge means interconnecting said two bar sections to each other at their inner ends for permitting said two end sections to be pivoted inward towards each other into a substantially parallel position with respect to each other, fourth hinge means interconnecting outer ends of two of said bars respectively between a corresponding leg on each of said pairs of legs adjacent bottom ends thereof for permitting each of said bar sections of said two bars to be pivoted to a substantially parallel position with respect to said corresponding leg connected thereto, fifth hinge means interconnecting outer ends of the third bar between said vertical legs adjacent bottom ends thereof for permitting each of said bar sections of said third bar to be pivoted to a substantially parallel position with respect to an associated connected one of said vertical legs;

wherein, in an unfolded condition, each of said side members and said three bars are horizontal and substantially parallel to each other, each of said end members are horizontal and substantially perpendicular to said side members, and said pairs of legs diverge downwardly from their respective junctions;

and in a folded condition, each of said end members are pivoted downward, said pairs of legs are placed inward toward their respective upright legs to provide folded ends, each of said side members are pivoted upward and inward, and said bars are pivoted upward and inward to bring said folded ends towards each other;

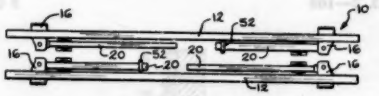
whereby longitudinal axes of each of said end sections, side sections, bar sections and legs are disposed in the same direction in said folded condition to provide a compact arrangement.

4,070,717

BED FRAME

John P. Kitchen; Terry L. Gabhart, both of Georgetown, and Joseph S. Lanham, Lexington, all of Ky., assignors to Hoover Ball and Bearing Co., Saline, Mich.

Filed Apr. 28, 1976, Ser. No. 681,133
Int. Cl.[2] A47C *19/12*
U.S. Cl. 5—176 R **7 Claims**



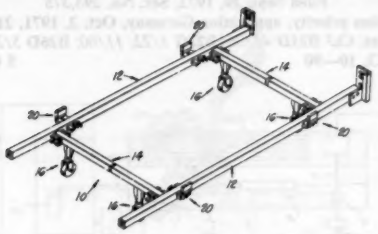
1. A bed carrying frame comprising a pair of generally parallel side rail members, a pair of end rail units each of which is comprised of two relatively telescoped end rail members, and corner bracket members mounting each of said end rail members on one of said side rail members, each of said bracket members including a trough shape portion configured to accommodate one of said side rails therein and vertically spaced flange portions integral with said trough shape portion, said flange portions being disposed on opposite sides of an end rail member and said trough shape portion having a side rail member disposed therein and secured thereto, pivot pin means mounting each end rail member on the flange portions of one of said bracket members for movement of said end rail member between a shipping and storage position disposed parallel to and adjacent the side rail member to which said end rail member is mounted and an operative position extending perpendicular to said side rail member, and means operatively associated with each of said end rail units releasably maintaining the end rail members therein in predetermined relative positions.

4,070,718

BOX SPRING RETAINER

Melvin P. Spitz, 619 N. Elm Drive, Beverly Hills, Calif. 90210

Filed Sept. 13, 1976, Ser. No. 722,706
Int. Cl.[2] A47C 19/04
U.S. Cl. 5—207 22 Claims



1. In a bed frame having an elongate side rail with a surface providing a support for a box spring adapted to project outwardly therebeyond, a box spring locating and retainer clip structure, comprising:

a. a generally L-shaped body structure having a base leg and a right-angled end leg at one end thereof, said legs being of fixed width;

b. means adjustably mounting said body on said rail for movements in extendable and retractable directions with said base leg extending transversely of the rail below said surface and with said end leg being positioned outwardly of said surface and projecting above the plane thereof to engage a projecting side of the box spring; and

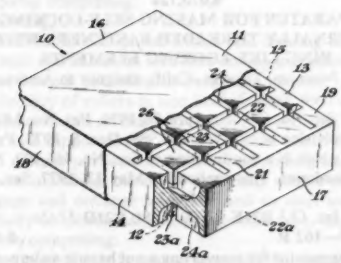
c. means for releasably latching said body against movement in said extendable direction from an adjusted position, including a manually operable latch member pivoted on one face of said base leg adjacent its juncture with the end leg for swinging movement over said one face to latched and unlatched positions with respect to a portion of the associated rail.

4,070,719

CUSHIONING ELEMENT

Charles W. Morgan, Rolling Hills, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sept. 1, 1976, Ser. No. 719,498
Int. Cl.[2] A47C 27/08
U.S. Cl. 5—355 5 Claims



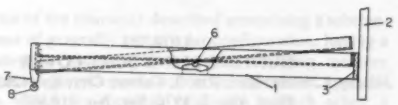
1. A cushioning element for seating or sleeping of humans and the like, the cushioning element having a synthetic resinous resilient cellular cushioning body, the cushioning body having ends and edges at least a principal human body-supporting face adapted to be disposed adjacent a human body when the cushioning element is in use, the cushioning body defining on the body-supporting face a plurality of grooves, the grooves having a width of from about one-eighth to about three-eighths of an inch, the plurality of grooves extending into the body and dividing the body-supporting face and a portion of the body adjacent to the body-supporting face into a plurality of adjacent spaced-apart bosses the grooves terminating at a location adjacent the ends and edges thereby providing an edge portion which is more resistant to compression than the area having grooves with the further limitation the bosses are individually deflectable and exhibit individual recovery when a deflecting force is applied and removed respectively, thereby providing a body-supporting face of a plurality of body-supporting face bosses each at least partially deformable independent of adjacent body-supporting face bosses.

4,070,720

DUAL PURPOSE HOME MEDICAL BED

Willie C. Edney, Rte. 5, Box 170B, Hendersonville, N.C. 28739

Filed June 9, 1975, Ser. No. 585,245
Int. Cl.[2] A45F 1/00; A61G 7/10
U.S. Cl. 5—62 3 Claims



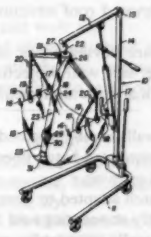
1. Therapeutic bedding for conventional usage comprising a headboard; first and second base frames vertically pivotally attached to said headboard at the head ends and movable support means at the foot ends of said base frames, said base frames being in side-by-side relationship and each adjacent the headboard at the head end in a closed position and at an angle away from each other in an open position; first and second mattress support frames attached to said first and second base frames, respectively, at least one mattress support frame being horizontally pivotally mounted in its respective base frame about the longitudinal center of said mattress support frame; and means for positioning said support frame at a predetermined level of inclination relative to said base frame about said longitudinal center, said means for positioning said support frame comprising at least one series of openings in said base frame radially equidistant from the pivot axis of said mattress frame, at least one corresponding opening in said mattress support frame, and at least one pin insertable in said base frame and mattress support frame openings to position the relative inclination of said mattress support frame to said base frame at the predetermined level.

4,070,721

SAFETY ATTACHMENT FOR INVALID LIFT AND TRANSPORT APPARATUS

William Stasko, 1058 Boyd Ave., Johnstown, Pa. 15905

Filed Oct. 26, 1976, Ser. No. 735,444
Int. Cl.[2] A61G 1/02
U.S. Cl. 5—89 3 Claims



1. In an invalid lift and transport apparatus, a mobile support, a hanger element on the support, a flexible patient support sling

suspended at its sides from said hanger element, a flexible safety strap attachment for the front of the sling having a lower end permanently secured to the sling near its forward edge and transverse center, said strap attachment having an upper end secured to said hanger element, said strap attachment arresting forward displacement of a patient being supported in said sling, said safety strap attachment formed in two separable sections, a quick coupling and release buckle joining said sections, said separable strap sections comprising a relatively short lower strap section permanently secured to said sling and an upper relatively long strap section secured to said hanger element, and said upper strap section having a top end loop adapted to embrace a center hub of the hanger element to thereby suspend the upper strap section from the center of the hanger element and above the center of the sling.

4,070,722

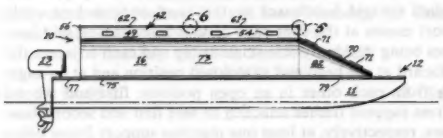
HUNTING BLIND BOAT COVER

Johnny L. Sutherland, Rte. 2, Calvert City, Ky. 42029

Filed Aug. 2, 1976, Ser. No. 710,858

Int. Cl.[2] B63B *35/72*

U.S. Cl. 9—5 **7 Claims**



1. A hunting blind adapted to be supported upon an elongated boat hull having an open top and a pair of opposed elongated gunwales, comprising:

a. an elongated, rigid, covered superstructure having main top, front and side walls, the width between said main side walls being substantially equal to the width of a boat hull having opposed elongated gunwales upon which the superstructure is to be mounted,

b. said main side walls having lower feet means adapted to detachably seat upon the elongated gunwales of said boat hull for supporting said superstructure above said hull,

c. said main top wall comprising a pair of opposed longitudinal structural members defining the side margins of an elongated head opening through said top wall and extending substantially the length of the center portion of said superstructure and having a width substantially less than the width between the main side walls of said superstructure, but wide enough to permit the passage therethrough of a man's body,

d. an elongated elevated roof structure covering said head opening,

e. said roof structure having a pair of opposed upper side walls, each upper side wall projecting upward from each of said longitudinal structural members above said main top wall,

f. said upper side walls having opposed upper edges defining the sides of an elongated hatch opening spaced vertically above said head opening,

g. an elongated hatch adapted to cover said hatch opening,

h. means operatively connecting said hatch cover to one of said upper side walls for opening and closing said hatch opening, and

i. a plurality of observation ports in both of said upper side walls.

4,070,723

METHOD AND ARRANGEMENT FOR CONTROLLING THE FEEDING OF RODS TO A WORK TOOL IN AUTOMATIC SCREW MACHINES AND THE LIKE

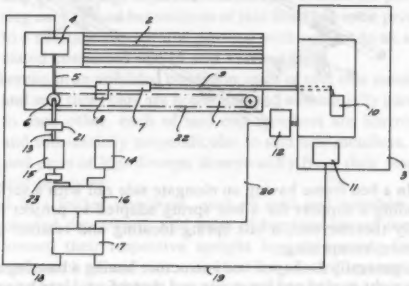
Hans Jurgen Jess, Kronshagen, and Karl-Heinz Friederichs, Kiel, both of Germany, assignors to Hagenuk Vormals Neufeldt & Kuhnke GmbH, Kiel, Germany

Filed Sept. 29, 1972, Ser. No. 293,375

Claims priority, application Germany, Oct. 2, 1971, 2149319

Int. Cl.[2] B21D *43/06;* B23G *1/22, 11/00;* B26D *5/20*

U.S. Cl. 10—90 **5 Claims**



1. A method for automatically monitoring and controlling the operation of a rod-working apparatus of the type including an automatically operating rod-feeding unit which feeds towards a cyclically operating work tool a certain length of rod per work cycle of the tool, comprising the steps of selecting a minimum and maximum distance through which a rod to be fed towards the tool is to be permitted to advance per work cycle of the tool; feeding a rod towards and into the range of operation of the tool; determining the actual distance advanced by said rod during a work cycle of said tool; determining whether said actual distance falls within the range defined between said minimum and maximum distances; terminating operations of said rod-feeding unit when said actual distance falls outside said range, said cyclically operating work tool having a null position which it assumes at the beginning of its work cycles; and further comprising the step of terminating operation of said work tool upon a determination that said actual distance falls outside said range but only when said work tool has been allowed to return to said null position thereof.

4,070,724

APPARATUS FOR MAKING SELF-LOCKING INTERNALLY THREADED FASTENERS WITH RING-LIKE LOCKING ELEMENTS

Richard S. Newnom, Tujunga, Calif., assignor to Amerace Corporation, New York, N.Y.

Division of Ser. No. 680,480, April 26, 1976, Pat. No. 4,035,859, which is a division of Ser. No. 637,989, Dec. 5, 1975, Pat. No. 3,975,787, which is a continuation of Ser. No. 466,499, May 2, 1974, abandoned. This application May 13, 1977, Ser. No. 796,662

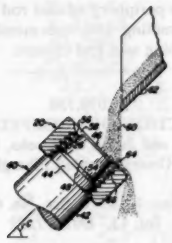
Int. Cl.[2] B21K *27/00, 1/64;* B21D *53/24*

U.S. Cl. 10—162 R **8 Claims**

1. In an apparatus for converting a nut having an imperforate wall providing the nut with external wrenching surfaces and an internal thread-defining surface into a self-locking nut of the prevailing torque type in which the self-locking characteristic is derived from a patch of plastic material adhered to said thread-defining surface, said patch being of a predetermined circumferential extent which is greater than 180° and further being axially limited so as to be spaced from both axial ends of said thread-defining surface:

a pin for entering said thread-defining surface from either end thereof, said pin including a terminal end, a generally

cylindrical shoulder portion axially spaced from said terminal end and extending axially along the pin for receiving the nut in seated relationship therewith and a frusto-conical, cavity-forming surface portion having the same axis as said cylindrical shoulder portion and tapered from



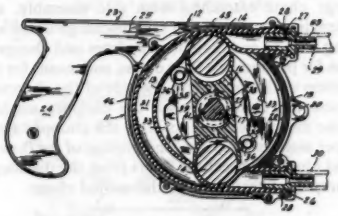
a larger diameter at the axial end thereof adjacent said shoulder portion to a smaller diameter at said terminal end, said frusto-conical surface portion also providing said pin with a pilot to facilitate engagement of the nut with said pin.

4,070,725

COMBINED PUMP AND SIPHON

Forrest L. Austin, Brooklyn Center, and Richard T. Cornelius, Minneapolis, both of Minn., assignors to Cornelius Engineering Center, Inc., New Hope, Minn.

Filed Nov. 7, 1975, Ser. No. 629,757
Int. Cl.[2] F04B *41/00, 43/08, 43/12, 45/06;* F04F *10/00*
U.S. Cl. 417—236 **10 Claims**



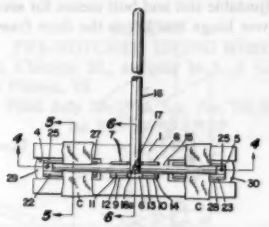
1. A pump comprising:
a. a housing;
b. a resilient tube disposed within said housing and having an inlet and an outlet, said tube having a portion intermediate its ends extending in an arcuate manner;
c. a plurality of rollers in said housing; and
d. support means within said housing supporting said rollers, said support means being rotatable about the axis of said arcuate portion for orbiting said rollers, said support means including means to shift said rollers radially to engage and collapse said tube and to shift said rollers radially to substantially disengage said tube, said support means comprising:
1. a pair of axially spaced generally flat sections joined together by a central drive hub, and rotatably supported by said housing concentric with the arcuate portion of said tube;
2. said sections having spirally arcuate bearing slots receiving journals on said rollers; and
3. a guide member rockable about said axis and carried on said hub and having a plurality of equally spaced arms extending radially therefrom, the distal end of each of said arms being bifurcated and guidingly embracing one of said rollers near its diameter.

4,070,726

DEVICES FOR CLEANING, DUSTING, MOPPING OR APPLYING FLUIDS TO FLOORS

Robert L. Joffre, 530 Parks Drive, Norton, Ohio 44203

Filed June 23, 1976, Ser. No. 698,886
Int. Cl.[2] A47L *13/256, 13/258*
U.S. Cl. 15—231 **4 Claims**



1. A device of the character described comprising a substantially flat base of generally rectangular configuration, having a clamping member secured thereto, said clamping member being of channel-shaped cross-section having spaced upstanding flanges which are movable relatively to each other, a wiping member comprising a cloth having marginal portions disposed in the space between said flanges, means comprising an elongated rod of round cross-section within said clamped member which wedgingly secures said marginal portions of said wiping member to said flanges, and a handle secured to said rod by a transverse pivotal connection, said handle being movable to cause said rod to rotate about its central longitudinal axis to provide a universal joint for the device.

4,070,727

DEVICE FOR AUTOMATIC DOOR CLOSING

Kazuyoshi Kanou, 81-49, Oaza Matsugo, Tokorozawa, Saitama, Japan

Filed Jan. 18, 1977, Ser. No. 760,434
Claims priority, application Japan, June 29, 1976, 51-84590
Int. Cl.[2] E05F *1/08, 5/06*
U.S. Cl. 16—72 **4 Claims**

1. A device for automatic closing of a door comprising:
a plate spring of predetermined length, having an arcuate cross-section and a center section, said spring having first and second ends and being bent about said center section at an angle deviating slightly from a straight line;
a stationary wall;
a hinge attached to said wall; and
a door openable and closeable about said hinge, the first spring end being attached to said wall and the second spring end being attached to said door.

4,070,728

VERTICALLY ADJUSTABLE DOOR HINGE ASSEMBLY

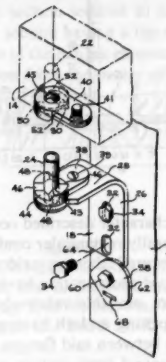
Charles J. Herman, Ellettsville, Ind., assignor to General Electric Company, Louisville, Ky.

Filed Oct. 26, 1976, Ser. No. 735,330
Int. Cl.[2] E05D *7/04*
U.S. Cl. 16—134 **1 Claim**

1. In a hinge assembly for a door of the center-hung type having a vertical door frame with a door opening therein, a

door mounted for pivotal movement on the door frame and adapted to close the door opening, a first pair of hinge brackets fastened to the door frame adjacent the upper and lower edges of the door, a second pair of complementary hinge means fastened to the door adjacent the hinge brackets, and vertically arranged hinge pin means between each hinge bracket and its complementary hinge means so the door may pivot with respect to the hinge brackets; the improvement comprising:

vertically adjustable slot and bolt means for securely fastening the lower hinge bracket to the door frame; and



a rotatable cam plate having a peripheral cam face in engagement with the underside of the lower hinge bracket, having tool-receiving means to permit leverage to be applied to rotate the cam plate, and having an adjustable means for securely fastening the cam plate to the door frame in any position, whereby said rotatable cam plate serves to adjust the position of the lower hinge bracket and additionally reinforces the holding power of said slot and bolt means.

4,070,729

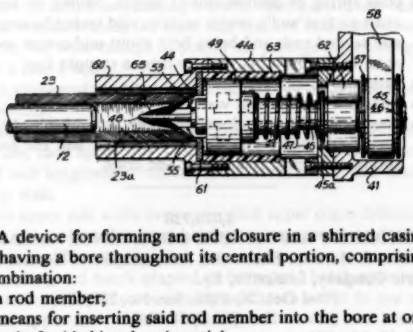
CLOSURE FOR SHIRRED CASING STICKS

Valdis M. Tums, Palos Park, and Thomas J. Maxwell, Lockport, both of Ill., assignors to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 604,113, Aug. 13, 1975, abandoned, which is a division of Ser. No. 538,458, Jan. 3, 1975, Pat. No. 3,914,447, which is a division of Ser. No. 242,932, April 11, 1972, Pat. No. 3,865,954. This application Dec. 6, 1976, Ser. No. 747,625

Int. Cl.[2] A22C *11/12*

U.S. Cl. 17—34 **8 Claims**



1. A device for forming an end closure in a shirred casing stick having a bore throughout its central portion, comprising in combination:

a. a rod member;

b. means for inserting said rod member into the bore at one end of said shirred casing stick;

c. rotatable, twisting member rotatable around said rod member and including means for engaging and twisting terminal pleats from said one end relative to the rest of said shirred casing stick into said bore;

d. means for urging said twisting member into engagement with and maintaining engagement with said terminal pleats;

e. means for rotating said rotatable, twisting member, whereby a twisted end closure is formed within said bore and around the periphery of said rod member; and

f. means for retracting said rod member from said bore without disturbing said end closure.

4,070,730

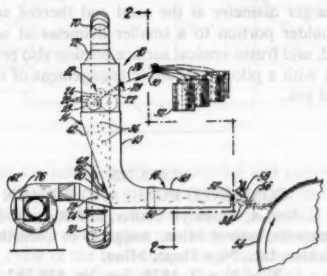
PRODUCTION OF CHOPPED FIBERS

Kenneth D. Pfeifer, and Julius C. Brooks, both of Huntingdon, Pa., assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jan. 12, 1976, Ser. No. 648,075

Int. Cl.[2] D01G *1/02*

U.S. Cl. 19—.58 **3 Claims**



1. Apparatus for producing chopped fibers from fibers of longer lengths, said apparatus comprising a chopper assembly, a discharge chute extending from said assembly, a second chute extending tranversely to said discharge chute and communicating with an end thereof away from said chopper assembly, means for producing a flow of gas, and means for directing a first portion of the flow, from the side of the chopper assembly opposite the chute, through the chopper assembly and through the discharge chute to carry the chopped fibers from the chopper assembly and a second portion of the flow through the second chute to direct the fibers from the discharge chute and to carry the fibers through the second chute.

4,070,731

METHOD OF AND APPARATUS FOR PACKAGING A LINEAR FIBROUS ELEMENT

Cletis L. Roberson, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 564,947, April 3, 1975, abandoned, which is a division of Ser. No. 510,935, Oct. 1, 1974, Pat. No. 3,912,479. This application Sept. 7, 1976, Ser. No. 721,026

Int. Cl.[2] B65H *54/80*

U.S. Cl. 19—159 R **12 Claims**

1. The method of packaging a linear fibrous textile element comprising:

linearly advancing a linear fibrous textile element downwardly to collect as a package in an upstanding open topped generally cylindrical rotating foraminous container;

establishing a reduced pressure effect to draw air from the container through its foraminous bottom wall to move air downwardly through the package at a velocity sufficient to prevent freedom of movement of the collected portion of the fibrous element at the upper surface region of the package during package formation;

maintaining the velocity of the air moved downwardly through the package substantially constant to continue to

prevent freedom of movement of the collected postion of the fibrous element at the upper surface region of the package during package formation; and,

simultaneously establishing a reduced pressure effect to draw air uniformly from all sides of the container in a

direction outwardly through the foraminous sidewall portion of the container above the package at a rate effective to reduce air turbulence in the container and thereby promote conditions in the container for ordered collection of the fibrous element during package formation.

4,070,732

TEXTILE FIBRE CONTROL SYSTEM IN A DRAWING DEVICE

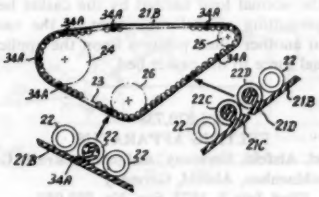
Jean Frederic Herubel, Guebwiller, France, assignor to Schlumberger & Cie, Guebwiller, France

Continuation of Ser. No. 592,471, July 2, 1975, abandoned. This application Dec. 21, 1976, Ser. No. 753,010

Claims priority, application France, July 16, 1974, 74 24653

Int. Cl.² D01H *5/70, 5/86*

U.S. Cl. 19—236 **8 Claims**



1. A textile fibre drawing device comprising a first fibre control system including a plurality of first elongate parallel control elements adapted to be progressed in a succession along a working path, said first control elements extending transversely to the direction of movement along said working path, and a second fibre control system including a plurality of second elongate parallel control elements made of elastomer and each extending transversely to said direction of movement and having a working face and a retaining portion opposed to said working face, a respective tubular support element corresponding with each said retaining portion and having therein a respective longitudinal slit into which said retaining portion projects, means for driving, guiding and orientating said second control elements to move along said working path whilst pressed against said first control elements of said first control system, feed roller means and drawing roller means to feed and draw, respectively, textile fibres to and from operating engagement between said first and second control elements, characterized in that each said retaining portion comprises a longitudinal fixing rib engaged in said slit and terminating in a retention head accommodated within the respective support element, each said second control element being of a width, measured in the direction of its movement along said path, corresponding to the space occupied by at least two of said tubular support elements, and being provided, at each of its ends, considered in the said direction, with a respective said fixing rib engaged in the said longitudinal slits in corresponding ones of said tubular support elements.

4,070,733

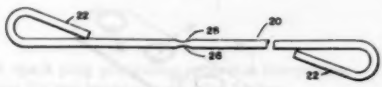
PRE-NOTCHED TIEING WIRES

Emil Simich, Chicago, Ill., assignor to A. J. Gerrard & Company, Des Plaines, Ill.

Filed July 26, 1976, Ser. No. 708,901

Int. Cl.² B65D *63/02*

U.S. Cl. 24—27 **6 Claims**



1. In a bale tie wire for use with press platens in a baling press for baling materials, the tie wire having a loop formed at each end of the wire in opposite directions thereof, and with a portion of each loop bent out of the plane of each respective loop in opposite directions thereof, including at least one notch predeterminedly positioned in the bale tie wire to provide engagement of the bale tie wire about the corners of the baled material and to permit alignment and engagement of each of the looped ends for fastening thereof.

4,070,734

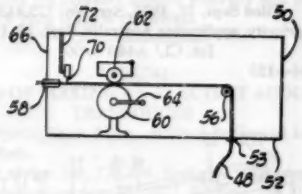
LOCKING MEANS FOR BALING WIRE

Ernest D. Paden, 6873 Center Road, Valley City, Ohio 44280; James E. Antolik, 6231 Sylvia Drive, Brookpark, Ohio 44142, and Keith W. Boldman, 26715 Bruce Road, Bay Village, Ohio 44140

Filed Aug. 7, 1975, Ser. No. 602,559

Int. Cl.² B65D *63/00*

U.S. Cl. 24—28 **1 Claim**



1. A method of securing a compressed bale of compacted waste material, comprising:

providing from a coil of wire a predetermined length of baling wire having free non-twisted distal ends;

wrapping said baling wire around said compressed bale;

locking the opposite free distal ends of said wire with a locking clip having a peripheral frame member and a centrally disposed raised arcuate member interconnected to said peripheral frame at opposed ends of the arcuate member, the raised arcuate member laterally spaced from the peripheral frame forming a first locking crotch therebetween at one arcuate connection and a second locking crotch therebetween at the other arcuate connection for locking the first free end and the second free end of said baling wire passing transversely between said arcuate member and said peripheral frame;

bending each free distal end portion of said baling wire to

form at least a right angle adjacently to entering each said crotch, and bending each said free distal end portion into a back-angled bend adjacently to said crotch after transversely passing through said crotch;

releasing the compression on the bale whereby the first and second free ends are locked without twisting within the first and second crotch respectively due to the tension of the baling wire.

4,070,735

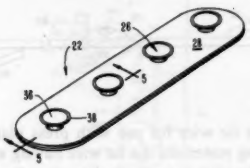
SHOWER CURTAIN FASTENER

William Canaday, P.O. Box 1723, Plainville, Mass. 02762

Filed Nov. 24, 1976, Ser. No. 744,626

Int. Cl.² A44B *21/00*; A47H *1/00*

U.S. Cl. 24—73 VA **10 Claims**



1. A fastener for temporarily holding a flexible shower curtain against the sidewall of a shower enclosure, said fastener comprising:

(a) flexible strip formed with a plurality of integral suction cups on one face thereof;

(b) a pressure sensitive adhesive layer superimposed on an opposite face of said flexible strip, said opposite face of said flexible strip formed with an expanded surface area to which said adhesive layer is attached; and

(c) a cover sheet having a release coating superimposed on said adhesive layer, said release coating in contact with said adhesive layer.

4,070,736

FASTENING DEVICE

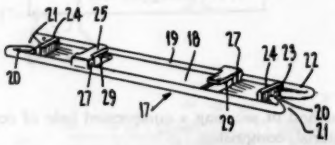
Walter Henry Land, 656 Nepean Highway, Frankston, Victoria, Australia (3199)

Filed Sept. 21, 1976, Ser. No. 725,413

Claims priority, application Australia, Sept. 25, 1975, 3324/75

Int. Cl.² A44B *9/00*

U.S. Cl. 24—153 **10 Claims**



1. A flexible, two-piece paper fastener constructed of plastics material and comprising a compressor with an aperture adjacent each end thereof, a base with an integral tongue extending from each end thereof, the junction of said base and each said tongue having a design radius forming a plastic hinge, one surface of each said tongue being roughened to engage a transverse knife edge on said compressor for engaging each said tongue when inwardly folded toward one side of said compressor as a means to prevent accidental longitudinal slipping of said tongue from said compressor, integral hook members, each having a post portion which is rigidly attached to said one side of the compressor and a transversely extending arm portion having catch means on its underside for engaging complementary catch means on the other surface of one said tongue to releasably retain said tongue in a snap-locking and quick-release arrangement under said arm portion to lock said tongues against accidental lateral displacement from said compressor.

4,070,737

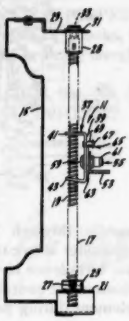
ADJUSTABLE BED MECHANISM FOR A CASKET

Charles R. Peterson, 918 Jackson Ave., River Forest, Ill. 60305

Filed May 7, 1976, Ser. No. 684,247

Int. Cl.² A61G *17/00*

U.S. Cl. 27—12 **11 Claims**



1. A tilting mechanism for a casket bed, said mechanism including:

a vertically extending threaded rod,

a bracket mounted on the threaded rod and movable vertically along the rod upon rotation thereof,

a pivotal connector joining the bracket and a casket bed frame,

the pivotal connector providing a predetermined, nonadjustable resistance to tilting movement of the casket bed frame relative to the bracket which resistance is sufficient to retain the casket bed frame in any selected tilted position under the normal load carried by the casket bed frame while permitting pivotal movement of the casket bed frame to another tilted position upon the application of additional force to the casket bed.

4,070,738

FELTING APPARATUS

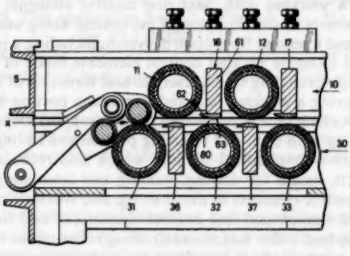
Volker Göbel, Alsfeld, Germany, assignor to Krafft Gobel KG Textilmaschinenbau, Alsfeld, Germany

Filed July 8, 1975, Ser. No. 593,980

Claims priority, application Germany, July 12, 1974, 2433602

Int. Cl.² D04H *17/12*

U.S. Cl. 28—137 **11 Claims**



1. Apparatus particularly suitable for felting and fulling of felt materials comprising a plurality of rollers having a given length arranged in two mutually overlying rows of rollers, said

rows defining therebetween a path through which a fleece may be passed in a given direction between said two rows of rollers, driving means for rotating said rollers, a compression beam located intermediate every two adjacent rollers in said two rows of rollers, said compression beam having a longitudinal extension corresponding substantially to said length of said rollers, with each of said compression beams having a side facing said path defined between said rows of rollers through which said fleece may be passed, means defining an arcuate surface on said side facing said path of each of said compression beams, said arcuate surface of each of said beams being curved on the side thereof facing toward said given direction of passage of said fleece with a generally convex configuration curving away from said path to define on one side of said path an entry aperture facing toward said given direction of passage of said fleece, and driving means coupled with said compression beams located in both said overlying rows of rollers for axially reciprocating said compression beams, said driving means operating to reciprocate said compression beams with variable predetermined amplitudes.

4,070,739

MANUFACTURE OF METAL STRIP

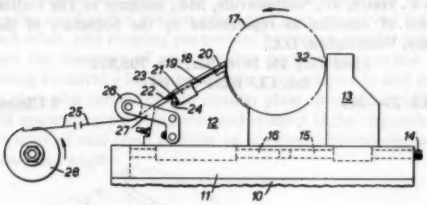
David P. Hague; Dalip T. Malkani; Andrew Middlemiss, and Stuart Scholey, all of Sheffield, England, assignors to British Steel Corporation, London, England

Filed Nov. 29, 1976, Ser. No. 745,560

Claims priority, application United Kingdom, Nov. 28, 1975, 49057/75

Int. Cl.² B21D *33/00*

U.S. Cl. 29—18 **7 Claims**



1. A method of manufacturing metal strip from a cylindrical workpiece whose longitudinal axis is greater than the desired strip width including rotating the cylindrical workpiece about its longitudinal axis, feeding a first cutting tool into the peripheral surface of the workpiece as it rotates so as to form a groove in the surface having a depth not less than the required thickness of strip peeled from the workpiece, said groove being spaced from one end of the workpiece by a distance equal to the desired strip width, feeding a second cutting tool continuously into the peripheral surface of the workpiece between the said one end of the workpiece and the groove made by the first cutting tool so as to produce a continuous metal strip peeled from the surface of the workpiece of width equal to the distance between the said one end of the workpiece and the said groove, the cutting tool being dimensioned so that it overlaps the said one end of the workpiece and extends into said groove to a position spaced from the shoulder of the workpiece created by the peeling operation and collecting the peeled strip by winding it around a coiler.

4,070,740

CONTINUOUS PRODUCTION HOT-SETTING INSTALLATION

Gerard Bardet, Paris, France, assignor to Automatisme & Technique, Arcueil, France

Filed Aug. 11, 1975, Ser. No. 603,574

Claims priority, application France, Sept. 3, 1974, 74.29949

Int. Cl.² H01J *9/46*

U.S. Cl. 29—25.19 **6 Claims**

1. A spark plug processing apparatus comprising:
means for pre-heating spark plug bodies;
means for setting said spark plug bodies;
means for continuously conveying said spark plugs from the input of said pre-heating means, through said pre-heating means, then through said setting means and to the output of said setting means;
said pre-heating means including a high frequency inductor in the form of a conductor;
said conductor having two parallel sectors with no more than a low degree of curvature whereby the lines of force of the field produced in said sector are substantially concentric circles;
a portion of each spark plug body having a thinner cross-section than the remainder of said body;
said conveying means moving said portion of said spark plug bodies along the lengthwise dimension of said conductor, between said sectors and on a level with said sectors whereby said spark plug bodies are heated and the heating of each spark plug body is concentrated generally in said portion; and
said setting means including a continuously operating turntable, a setting turret assembly having slide blocks for applying setting pressure to the plug bodies, and resilient means for metering the pressure applied whereby said portion of each spark plug body is deformed.

4,070,741

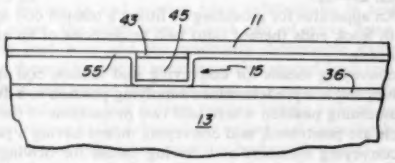
METHOD OF MAKING AN ELECTRET ACOUSTIC TRANSDUCER

Svetislav V. Djuric, Stow, Mass., assignor to Genrad Inc., West Concord, Mass.

Continuation of Ser. No. 726,598, Sept. 27, 1976, abandoned. This application Apr. 18, 1977, Ser. No. 788,317

Int. Cl.² H04R *31/00*

U.S. Cl. 29—25.42 **7 Claims**



1. The method of making an electret acoustic transducer comprising:
laminating an elastic diaphragmatic plastic film with a layer of material of predetermined thickness; selectively removing undesired portions of said layer of material, leaving a

desired post pattern on the film; metalizing the post side of said film to render it conductive; securing said film to a supporting ring;

providing a conductive backplate carrying on one face thereof a layer of polarized electret material which is itself insulating;

mounting said backplate and said ring in juxtaposition in a transducer assembly with said post pattern contacting the electret layer, the diaphragmatic film being deformed and spaced from the backplate thereby.

4,070,742

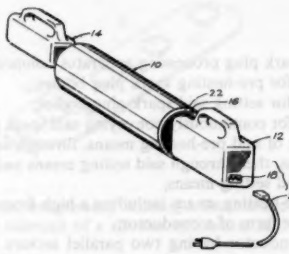
MOTORIZED ROLLING PIN

Claire Dorfman, 2251 Faunce St., Philadelphia, Pa. 19152

Filed Dec. 13, 1976, Ser. No. 750,329

Int. Cl.[2] B05C *1/08*

U.S. Cl. 29—110.5 **9 Claims**



1. A motorized rolling pin, comprising:

a cylindrical roller member, having a longitudinal central axis;

a first handle, rotatably connected to one end of said roller member, disposed along and rotatable about said central axis;

a second handle rotatably connected to the end of said roller member opposite from said first handle, disposed along and rotatable about said central axis;

means mounted exclusively in said first handle for imparting rotatational energy to said roller member to spin said roller member about said central axis, between said first and said second handles; and,

means for controlling said rotational energy imparting means.

4,070,743

APPARATUS FOR MOUNTING TENSION COIL SPRING ONTO ARTICLE

Seii Miyakawa, Yokohama; Takashi Kobayashi, Fujisawa; Masaya Kishi, Kamakura, and Kenji Ogiro, Yokohama, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Sept. 1, 1976, Ser. No. 719,582

Claims priority, application Japan, Sept. 3, 1975, 50-105943

Int. Cl.[2] B23P *19/04*

U.S. Cl. 29—227 **12 Claims**

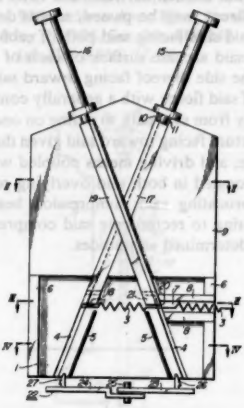
1. An apparatus for mounting or fitting a tension coil spring at both hook ends thereof onto two projections of an article comprising:

a. conveying means for conveying said tension coil spring supplied at a predetermined supplying position to a distant mounting position where said two projections of the article are positioned, said conveying means having a pair of conveying members and driving means for driving said conveying members;

b. guide means defining a pair of guide paths for allowing said conveying members to be carried therealong by said driving means from the supplying position to the mounting position and

c. members for restraining said tension coil spring at its both hook ends during the conveyance of said spring from the supplying position to the mounting position by said conveying means;

said guide paths being so formed that the pair of the conveying members guided by the guide paths are apart from each other in a non-stretched length of said spring at the supplying position and in a stretched mountable length of said spring at the mounting position, respectively, and that



the space between the guide paths is gradually increased so as to gradually increase the space between the conveying members guided by said guide paths from the supplying position to the mounting position, and said restraining members removing restraint of said spring at the mounting position when the both hook ends of said spring have already been positioned in contactable position with said two projections of the article.

4,070,744

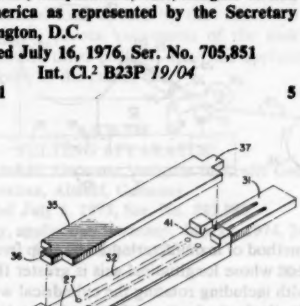
WASHER ALIGNING AND PLACING TOOL

Lewis C. Hartz, Jr., Simpsonville, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 16, 1976, Ser. No. 705,851

Int. Cl.[2] B23P *19/04*

U.S. Cl. 29—241 **5 Claims**



1. An apparatus for the assembly of components, having a hole therethrough, onto the pins of a structure having a plurality of said pins positioned in a predetermined manner on a base, comprising:

a jig having extending therethrough a plurality of apertures positioned in an identical pattern to the pattern of said pins, said apertures extending through said jig and having a dimension sufficiently large to admit said components;

means for loading said components into said apertures; and

a slideably removable furcated element adapted to fit and disposed below and in contact with said jig, said element

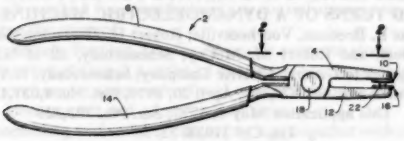
having slots formed between said furcations, said slots extending longitudinally from one end of said element to a point near the opposite end of said element and having a width smaller than said components but sufficiently large to admit said pins, thereby preventing said components from falling through said apertures, said slots disposed within said element such that when said element is in place below said jig and said jig and element are placed over said structure and in contact therewith, said pins extend through said slots and said holes of said components, such that when said element is removed by laterally pulling said element from said jig in a direction parallel to said slots, said components retained in said apertures by said element fall onto said pins.

4,070,745

CRIMPING TOOL

Arthur H. Schimmelman, Agura, Calif., assignor to Precision Dynamics Corporation, Burbank, Calif.

Filed July 21, 1976, Ser. No. 707,308
Int. Cl.[2] B23P *19/04*
U.S. Cl. 29—268 **12 Claims**



1. A hand-held, eyelet crimping tool comprising a pair of opposed jaws with handles and linkage for movement of the jaws toward and away from each other, one of said jaws having an annular anvil platen portion on the terminus thereof, the other of said jaws having a forming pin portion on the terminus thereof, said annular anvil platen portion being adapted for abutting relationship to said forming pin portion when said jaws are in the crimping position, said pin portion being centrally located and adapted to be superposed centrally of said annular anvil platen portion when said jaws are moved toward each other, said forming pin portion having an annular plate at least the diameter of said annular anvil platen portion and having a centrally located upstanding pin relative to said annular plate, the surface of said annular plate circumferentially of said upstanding pin being recessed relative to the circumferential edge of said plate to form an upraised circumferential lip about said edge.

4,070,746

METHOD FOR COVERING AN ARTICLE WITH A RECOVERABLE SLEEVE

Joseph H. Evans, Palo Alto, and Richard B. Wolfe, Menlo Park, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Division of Ser. No. 587,267, June 16, 1975. This application Sept. 3, 1976, Ser. No. 720,611
Int. Cl.[2] B23P *11/02*
U.S. Cl. 29—450 **5 Claims**

1. The method of covering a member comprising:

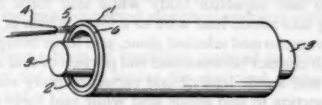
positioning over said member a recoverable tubular article comprising;

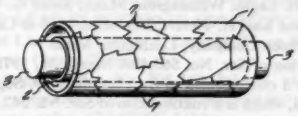
a tubular sleeve held under tension in an expanded condition such that upon the release of the tension the sleeve tends to assume a small diameter;

a restraint having an essentially tubular configuration;

a bond between the sleeve and the restraint to hold said sleeve in its expanded condition, said bond being capable of being sufficiently weakened by the application of a solvent to allow the sleeve to pull away from the restraint and return to its smaller diameter; and

applying a solvent to the bond between the sleeve and the restraint to thereby weaken the bond sufficiently to cause





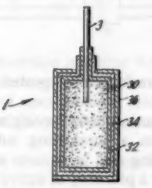
the sleeve to peel away from the restraint and shrink down about said member.

4,070,747

ANODE AND CATHODE LEAD WIRE ASSEMBLY FOR SOLID ELECTROLYTIC CAPACITORS

Richard Arthur Lambrecht, Greenville, S.C., assignor to Union Carbide Corporation, New York, N.Y.

Filed Dec. 22, 1976, Ser. No. 753,566
Int. Cl.[2] B01J *17/00*
U.S. Cl. 29—570 **1 Claim**



1. Method for providing an anode lead wire and a cathode lead wire on a solid electrolytic capacitor having a substantially cylindrical body including an anode, an anode lead in contact with and connected to the anode and extending along the longitudinal axis of said cylindrical body, a dielectric layer on the anode, a solid electrolytic cathode layer on the dielectric layer, said method comprising: providing a pair of cantilever mounted preshaped, resilient wires, each wire of said pair of wires having resiliently deformable extended portions substantially parallel to each other and substantially lying in a selected plane containing the longitudinal axis of said cylindrical capacitor body, one of said pair of wires being an anode lead wire and the resiliently deformable extended portion thereof having an end portion lying substantially in said selected plane, the other wire of said pair of wires being the cathode lead wire and the resiliently deformable extended portion thereof having an arcuate portion spaced from said end portion of said anode lead wire lying in a plane transverse to said selected plane, said arcuate portion having a shape generally conforming to the substantially cylindrical capacitor body; positioning said cylindrical capacitor body with respect to said anode lead wire such that said anode lead of said cylindrical capacitor body is closely adjacent to said end portion of said anode lead wire; positioning said cylindrical capacitor body with respect to said cathode lead wire such that said cylindrical capacitor body is closely adjacent to the generally conforming arcuate portion of said cathode lead wire; subjecting said resiliently deformable extended portion of said cathode

lead wire to a force which is in a direction transverse to said selected plane, said force being sufficient to establish a nesting contact between said arcuate portion of said cathode lead wire and said cylindrical capacitor body; soldering said arcuate portion to said capacitor body while said force is applied; subjecting said anode lead wire to a force which is in a direction transverse to said selected plane, said force being sufficient to establish contact between said end portion of said anode lead wire and said anode lead of said capacitor body and welding said end portion to said anode lead while said force is applied.

4,070,748

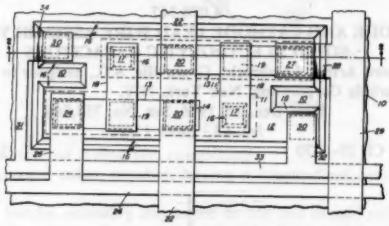
INTEGRATED CIRCUIT STRUCTURE HAVING SEMICONDUCTOR RESISTANCE REGIONS

Wilhelm H. Legat, Wilmington, Mass.; Keith G. Taft, Ben Lomond, and Karl H. Tiefert, Los Altos, both of Calif., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 563,429, March 31, 1975, abandoned, which is a continuation of Ser. No. 401,319, Sept. 27, 1973, abandoned, which is a continuation of Ser. No. 242,457, April 10, 1972, abandoned. This application Aug. 30, 1976, Ser. No. 719,201

Int. Cl.² B01J *17/00*

U.S. Cl. 29—577 C **12 Claims**



1. The method of forming an integrated circuit comprising the steps of:

forming a semiconducting layer having a <100> crystallographic surface on a supporting substrate comprising epitaxially depositing said layer over said substrate;

forming in said layer a plurality of active elements with said elements having a plurality of emitter regions formed in common base regions, base contacts formed on said base regions intermediate said emitter regions, and resistive regions comprising portions of said epitaxial layer directly connected to collector regions, said collector regions forming collector junctions with said base regions, portions of the boundaries of said resistive regions being formed by etching said layer from said <100> crystallographic surface along <111> crystallographic surface planes at least through said layer; and

forming conductors which are supported on insulating layers on said <100> and <111> surfaces of said layer and which interconnect regions of at least some of said elements.

4,070,749

METHOD OF MANUFACTURING LIQUID CRYSTAL DISPLAY DEVICES

Masayoshi Misono, Chiba; Masaharu Koyama, and Tutomu Asida, both of Mobara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

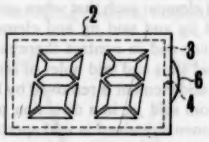
Filed June 30, 1976, Ser. No. 701,141

Claims priority, application Japan, July 4, 1975, 50-81827

Int. Cl.² G02F *1/13*

U.S. Cl. 29—592 R **11 Claims**

1. A method of manufacturing a liquid crystal display device comprising the steps of forming a dam made of frit glass having a liquid crystal inlet opening on at least one of paired insulating substrates, at least one of the substrates being transparent and provided with a transparent electrode, putting together a resultant structure and the other insulating substrate at the dam and baking the frit glass at a predetermined temperature to complete a liquid crystal cell, metalizing area surrounding the



liquid crystal inlet opening, filling a liquid crystal into said cell through said opening, and sealing said liquid crystal inlet opening with a molten sealing material in an atmosphere in which the surface portion and the inner portion of said molten sealing material have substantially the same viscosity.

4,070,750

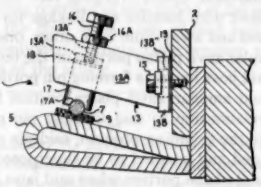
TIELESS BRACING AND METHOD FOR SUPPORTING END TURNS OF A DYNAMOELECTRIC MACHINE

Thomas E. Brennan, Voorheesville; Robert H. Hartmann, Gansevoort, and Robert M. McCoy, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 678,601, April 20, 1976, Pat. No. 4,037,126. This application May 3, 1977, Ser. No. 793,339

Int. Cl.² H02K *15/06*

U.S. Cl. 29—596 **3 Claims**



1. A tieless method of bracing the winding end turns of a dynamoelectric machine comprising the steps:

1. providing a dynamoelectric machine having a frame with a stator mounted therein, said stator being provided with slots adapted to receive an insulated winding therein, said insulated winding having end turns that extend beyond opposite ends of the frame when said winding is assembled in the stator slots,
2. mounting a plurality of generally T-shaped brackets on said frame at angularly spaced points radially outward from the end turns, each of said brackets being provided with a cup-shaped recess facing the stator winding and having a threaded aperture through its base to receive a dowel-driving bolt therethrough,
3. mounting a transversely grooved dowel and an associated dowel-driving bolt on each of said brackets, with each dowel slidably mounted in one of the cup-shaped recesses and each bolt threaded through one of said apertures,
4. providing a split metal annulus having a spreader means for enlarging the diameter thereof,
5. adjusting the annulus spreader means to open the annulus to a desired extent relative to said end turns,
6. positioning an absorbent, compressible material between the annulus and the stator winding end turns,
7. clamping said metal annulus at a predetermined diameter against the stator winding end turns by adjusting each of said bolts in sequence to slide the transverse grooves in the dowels against the annulus,

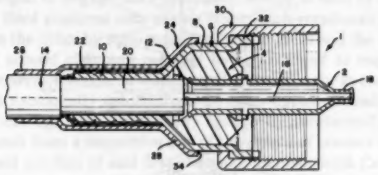
8. impregnating the winding and coating said compressible material with insulating resin, and
9. curing said resin.

4,070,751

METHOD OF MAKING A COAXIAL CONNECTOR

Richard Shure Hogendobler, Camp Hill, and Robert Maclay Murray, Elizabethtown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jan. 12, 1977, Ser. No. 758,731
Int. Cl.² H01R *43/04*
U.S. Cl. 29—628 **2 Claims**



1. A method for manufacturing a coaxial connector, comprising the steps of:
separately forming a series of center contacts along a first carrier strip and a series of connector bodies along a second carrier strip each of said connector bodies having at least one slit and a longitudinal seam,
assembling said series of center contacts together with corresponding dielectric slugs encircling said center contacts concentrically within said series of connector bodies to form a series of subassemblies,
retaining said series of subassemblies along at least one of said carrier strips,
conveying said series of subassemblies together with said at least one of said carrier strips to an assembly station where at each said subassembly is assembled to a coaxial cable and is separated from said at least one of said carrier strips, and
covering said at least one slit and said longitudinal seam of each connector body with a seamless ferrule.

4,070,752

METHOD OF MAKING AN ELECTRICAL SWITCH AND CHEMICALLY MILLED CONTACTS

James H. Robinson, Elkhart, Ind., assignor to CTS Corporation, Elkhart, Ind.

Division of Ser. No. 532,744, Dec. 16, 1974, Pat. No. 4,019,000. This application Mar. 23, 1977, Ser. No. 780,438
Int. Cl.² H01H *11/04*
U.S. Cl. 29—630 B **8 Claims**

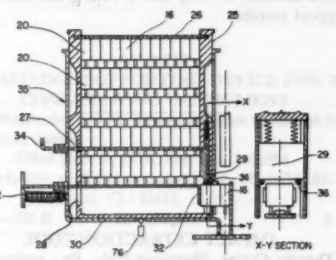
1. A method of producing an electrical switch component comprising the steps of:
(a) producing a pattern for fabricating a plurality of interconnected electrical contacts within a portion of a strip of metal;
(b) defining the pattern on a first side of the strip of metal by the application of an acid resistant coating thereto;
(c) defining the pattern on the other side of the strip in mirror image registry with the pattern on the first side by the application of an acid resistant coating to the other side of the strip;
(d) chemically milling both sides of the strip to selectively open areas therethrough and thereby to produce a plurality of the interconnected electrical contacts within a portion of the strip;
(e) attaching a body of insulating material to selective portions of the strip to secure the electrical contacts to the body; and
(f) severing the electrical contacts from each other and from adjoining portions of the strip.

4,070,753

AUTOMATIC INSERTION MACHINE FOR INSERTING RADIAL LEAD ELECTRONIC COMPONENTS

Clark Wen-Hai Liu, No. 25, Alley 8, Lane 18, T'ung-Ho Street, Taipei, Taiwan, China /Taiwan

Continuation-in-part of Ser. No. 705,342, July 14, 1976. This application Dec. 27, 1976, Ser. No. 754,097
Int. Cl.² H05K *3/30*
U.S. Cl. 29—741 **5 Claims**



1. An automatic insertion machine which can automatically and continuously insert radial lead electronic components one by one onto a printed circuit board, said machine comprising:
a. an insertion head for punching components onto a printed circuit board;
b. means to retain electronic components in a plurality of rows;
c. a feeding and advancing mechanism for advancing a first one of said rows toward said insertion head where an endmost component of the advanced row is inserted into said board and for feeding said rows of electronic components into alignment with the advancing mechanism such that all the components in a row are inserted into the board in sequence, and one row is used after another;
d. a storage bin for supporting said feeding mechanism and storing said electronic components; and
e. a magnetic chuck for fixing the machine to a work surface.

4,070,754

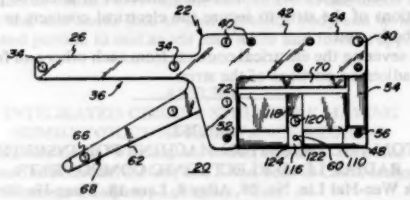
HAND TOOL FOR JOINING OBJECTS

Michael Bauerkemper, Cerritos, Calif., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed Oct. 22, 1976, Ser. No. 735,008
Int. Cl.² H01R *43/04*
U.S. Cl. 29—749 **16 Claims**

1. A hand tool for joining two or more objects together comprising: a frame member having a first end portion, a second end portion and an intermediate portion therebetween; a movable support member having first and second ends, said first end pivotally coupled to said intermediate portion of said frame member to permit movement of said support member second end with respect to said frame member second end portion; a latch bar pivotally coupled to said second end of said support member and releasably coupled to said frame member second end portion to prevent relative movement of said support member with respect to said frame member; handle means

having first and second ends, said second end of said handle means pivotally coupled to said intermediate portion of said frame member; presser plate means; first coupling means coupled to said presser plate means and said frame member between said intermediate portion and said second end portion;



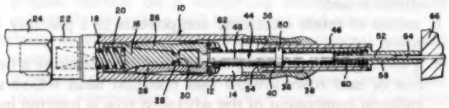
and second coupling means coupling said presser plate to said second end of said handle means; the arcuate movement of said first end of said handle means towards said first end portion of said frame member driving said presser plate axially towards said support member.

4,070,755

IMPACT EXTRACTION TOOL

Clyde Thomas Carter, Shermans Dale, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed July 12, 1976, Ser. No. 704,143
Int. Cl.² H01R *43/00*
U.S. Cl. 29—764 **6 Claims**



1. An impact extraction tool for driving friction mounted contacts from apertures in printed circuit boards, electrical connectors, and the like, said tool comprising:

a hollow tubular tool body member;

a hammer body movably mounted within said tool body member;

first spring means mounted between one end of said tool body member and said hammer;

trigger means within said tool body member and controlling release of said hammer;

a cap housing assembly secured to the other end of said tool body member and including a cylindrical housing cap and a plunger housing sliding coaxially within said housing cap;

a plunger movably positioned within said plunger housing and having a first end portion for actuating said trigger means and a second end portion for engaging said contact;

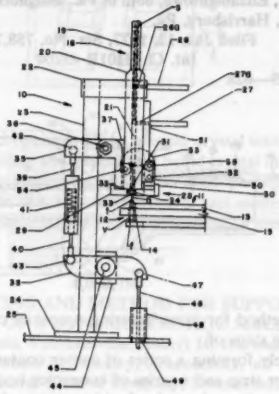
second and third spring means biasing said plunger with respect to said trigger and said plunger with respect to said plunger housing, respectively, whereby predetermined movement of said plunger causes movement of said plunger housing prior to the tripping of said trigger at which time an impact is delivered by the hammer body to the plunger to drive the contact from its seat.

4,070,756

APPARATUS FOR HOLDING HYPODERMIC NEEDLES STRAIGHT AND PLACING SHEATHS THEREON

Walter A. Shields, 181-41 Henley Road, Jamaica, New York, N.Y. 11432

Filed Nov. 24, 1976, Ser. No. 744,678
Int. Cl.² B23Q *7/10*
U.S. Cl. 29—809 **3 Claims**



1. The combination of apparatus for placing a sheath on a vertically oriented hypodermic needle, the sheath having an open end for receiving the hypodermic needle, and apparatus for assuring the straightness of the hypodermic needle thereby to facilitate the placing of the sheath on said hypodermic needle, the sheath placing apparatus comprising an upright magazine for containing a stacked plurality of the sheaths with the openings thereof oriented downwardly, a downwardly extending passage having an upper end communicating with the magazine and a lower end having a discharge opening arranged on a vertical axis with which the hypodermic needle is to be aligned for being received in a respective said sheath discharged from the discharge opening onto the hypodermic needle, a first gate defining the boundary between the magazine and the passage and for blocking transit of a sheath from the magazine into the passage and a second gate below the first gate a distance about equal to the length of a respective said sheath for blocking transit of said sheaths to the discharge opening of the passage, whereby said sheaths may be individually discharged by gravity onto respective said hypodermic needles consecutively positioned in alignment with said axis by a cycle constituting closing the first gate of the loaded apparatus while the second gate is closed thereby to isolate the lowermost of said sheaths between said first and second gates, then opening the second gate thereby to permit the lowermost one of said sheaths of said stack to drop out of the discharge opening over the hypodermic needle aligned with said axis, then closing the second gate and opening the first gate to permit the now lowermost one of said sheaths of the stack to descend onto the second gate, and repeating said cycle for each said sheath which is to be deposited on a respective said hypodermic needle, and the straightness assuring apparatus comprising straightening means movable between an open inoperative condition and a closed operative condition for engaging said hypodermic needle with only point contact at first, second and third consecutive positions along the length of said hypodermic needle, said engaging at said first and third positions, on the one hand, and said engaging at said second position, on the other hand, being in opposition and holding the hypodermic needle in a straight configuration, and means for effecting movement of said straightening means between said inoperative and operative conditions thereof, said straightening means comprising first and second clamping members, said first clamping member including means defining a pair of like sub-

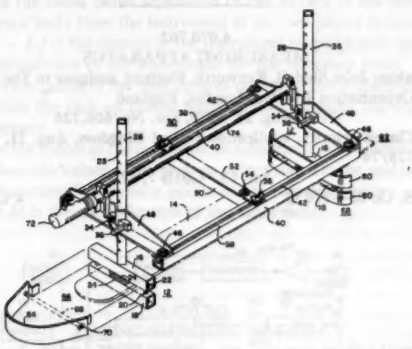
stantially right-angled notches which are vertically spaced and vertically aligned throughout on lines parallel to the axis of the elongated member when the clamping members are closed and said second clamping member including means defining a substantially right-angled notch similar to but opposite to the two notches of said first clamping member and being located between the two notches of said first clamping member when the clamping members are closed, said three notches being arranged to engage said hypodermic needle at the respective said three positions when said clamping members are closed thereby to hold the hypodermic needle in a straight configuration, the two notches of said first clamping member being arranged to engage the hypodermic needle at each of said first and third positions only at two points each rotationally spaced from the other by substantially ninety degrees and the notch of said second clamping member being arranged to engage the hypodermic needle at said second position only at two points each rotationally spaced from the other by substantially ninety degrees and each rotationally spaced by substantially ninety degrees from a respective one of the points of contact of either of said notches of said first clamping member with the needle.

4,070,757

LOG SAWING ATTACHMENT FOR A CHAIN SAW

Elof Granberg, San Rafael, Calif., and Emil Adolph Olsen, North Burnaby, Canada, assignors to Granberg Industries, Richmond, Calif.

Filed Nov. 8, 1976, Ser. No. 739,509
Int. Cl.² B27B *17/02, 27/02*
U.S. Cl. 30—371 **10 Claims**



1. A log sawing attachment for chain saw comprising

a pair of clamping means for engaging opposite ends of the cutter bar of a chain saw, each of said clamping means being formed with a pair of locking bars which extend beyond the edges of the cutter bar and saw chain and are adjustably interconnected at their opposite ends outside the chain path permitting the locking bars to be drawn together to clamp the chain saw cutter bar therebetween,

a pair of support posts, each of said posts being secured to one of said clamping means and disposed to project perpendicularly from said cutter bar on the same side thereof,

a guide frame adjustably mounted on said support posts for guiding the chain saw to cut at a preselected depth in the log being sawed, said guide frame including a pair of flat bottomed slide members having their bottom surfaces disposed in a plane parallel said cutter bar and which slide along the flat surface being used to guide the chain saw during the saw cut, said slide members being interconnected by a pair of spreaders and disposed in parallel relation on opposite sides of a plane formed between said support posts, said spreaders being adjustably clamped to said support posts to permit variable spacing of the guide frame with respect to the chain saw cutter bar,

a guide fence secured to the clamping means disposed at the drive end of the cutter bar, and

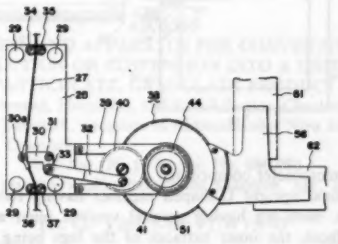
a handle secured to said guide frame disposed on the race end of the cutter bar.

4,070,758

STRAIGHTEDGE SUPPORTING DEVICE FOR RAIL TYPE DRAWING INSTRUMENT

Yoshinori Watanabe, Tokyo, Japan, assignor to Mutoh Industry Ltd., Tokyo, Japan

Filed Dec. 9, 1976, Ser. No. 749,084
Claims priority, application Japan, Dec. 20, 1976, 51-152304
Int. Cl.² B43L *13/02*
U.S. Cl. 33—76 R **6 Claims**

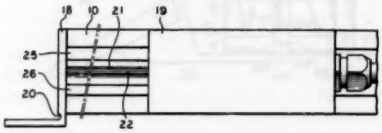


1. A rail type drawing apparatus having a straightedge supporting device, said apparatus comprising a cross rail disposed at a side portion of a drawing board, a cross cursor slidably mounted on the cross rail, a longitudinal rail connected to the cross cursor at right angles to the cross rail, a weight means mounted for shifting movement along the longitudinal rail, a longitudinal cursor mounted on the longitudinal rail for shifting movement therealong, a head connected to the longitudinal cursor, a ruler mounting plate rotatably mounted on the head, a straightedge means adjustably mounted on the ruler mounting plate, means for fixedly engaging the ruler mounting plate to the head and disengaging it therefrom, a rope means having one end connected to said weight means and having exerted thereon a force in one direction due to the effect on gravity on said weight, the other end of said rope means being coupled to said longitudinal cursor and having a force exerted thereon by the weight of said cursor, said head, said plate and said straightedge means in the opposite direction, and turning force converting means mechanically coupled between said ruler mounting plate and said rope means for converting the rotary motion of the straightedge means around the head in a plane parallel with the surface of the drawing board under the effect of gravity into a force opposite to the direction of the force exerted on the rope by the weight means.

4,070,759
SEALED INCREMENTAL MEASURING DEVICE HAVING AN ARTICULATED FASTENING MEANS FOR MOUNTING THE HOUSING

Günther Nelle, Siegsdorf, Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Germany

Filed Feb. 9, 1976, Ser. No. 656,745
Claims priority, application Germany, Feb. 11, 1975, 2505585
Int. Cl.² G01B 11/04
U.S. Cl. 33—125 C 12 Claims

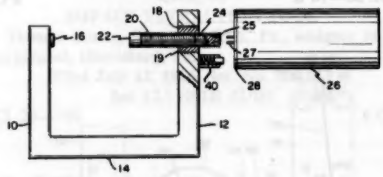


5. The measuring instrument of claim 1 wherein one of said legs in each pair forms one of the ends of the hollow body and the other of said legs in each pair is adapted for attachment to the object to which the hollow body is fastened.

4,070,760
MICROMETER

Leo Roth, and Ursula Roth, both of 52-27 69th St., Maspeth, N.Y. 11378

Filed Nov. 26, 1976, Ser. No. 745,091
Int. Cl.² G01B 3/18
U.S. Cl. 33—166 7 Claims



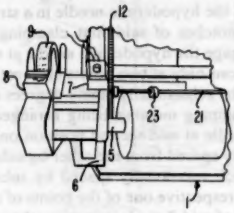
1. A micrometer comprising:
a vertical upright U-shaped member having two parallel legs, each leg having parallel vertical inner and outer surfaces, the inner surfaces of the legs being disposed adjacent and parallel to each other, one of the legs having a horizontal threaded bore extending transversely between its outer and inner surfaces, the bore being disposed adjacent the upper end of the said one leg;
a sleeve having an internal thread and removably disposed in the bore;
one flat disc lying in a vertical plane and secured to the inner surface of the other leg, the disc having its center aligned with the axis of said bore; and
a threaded shaft threadedly engaging said sleeve, said shaft having a front portion which extends through the sleeve into the space between the legs and having a rear portion which extends outwardly from the outer surface of said one leg, the front portion being non-magnetic, the rear portion being magnetic.

4,070,761
PRINTING PRESS WITH INVENTORY CONTROL

Joseph Martin Collins, Ontario, N.Y., assignor to Burroughs Corporation, Detroit, Mich.

Filed May 19, 1976, Ser. No. 687,807
Int. Cl.² G01B 5/08
U.S. Cl. 33—172 F 7 Claims

1. A web printing press comprising:
a frame;
a print and wind station;
a load roll station;
a spindle disposed in said load roll station and journaled in said frame for mounting a supply roll of paper to feed the press;
scale means disposed in a plane substantially perpendicular to the axis of said spindle and structurally extending from said spindle to the maximum radius of a supply roll mounted on said spindle;

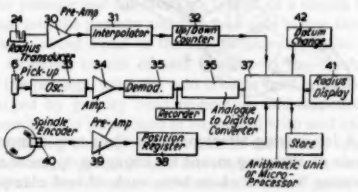


indicia carried by said scale means and visually displayed thereon between said spindle and a radial distance of at least the maximum radius of the roll; and
monitoring means conjointly cooperating with both the outer circumferential surface of the roll and said scale means, said cooperation occurring substantially along the cylindrical plane defined by the outer circumferential surface of the roll, and said monitoring means transducing the radius of the roll into a visual indication thereof.

4,070,762
MEASURING APPARATUS

Graham John Siddall, Keyworth, England, assignor to The Rank Organisation Limited, London, England

Filed Aug. 21, 1975, Ser. No. 606,724
Claims priority, application United Kingdom, Aug. 21, 1974, 36725/74
Int. Cl.² G01B 7/34
U.S. Cl. 33—174 Q 4 Claims



1. A method of determining the radius of curvature of the curved surface of a component under test using a roundness measuring instrument of the type comprising:
a workpiece table,
a pick-up,
amplifier means connected to said pick-up,
a pick-up mount supporting said pick-up, and
means interconnecting said pick-up mount and said workpiece support table such that said pick-up and said table are relatively rotatable about a main axis of the instrument and said pick-up is adjustable radially towards or away from said main axis so as to be brought into contact with a workpiece on said workpiece support table to produce output signals representative of the surface of said workpiece,
a displacement transducer having a body connected to one of said pick-up mount and a fixed frame member which is fixed with respect to said main axis, and a sensing element movable with respect to said body and attached to the

other of said fixed frame member and said pick-up mount, and

means connected to the output of said pick-up amplifier means and to the output of said displacement transducer and operating to produce an instrument output signal representing the sum of the signals from said pick-up and said displacement transducer,

whereby to provide output signals representing the radial displacement of said pick-up over a limited range,

said method comprising the steps of:

locating a reference body on the table of said instrument,

obtaining at least two instrument output signals representing the radial separation of the surface of said reference body from the axis of relative rotation at at least two points spaced diametrically opposite one another across the said axis of relative rotation, and storing said two instrument output signals,

substituting a component under test for said reference body,

obtaining a plurality of instrument output signals representing the separation of the surface of the component under test from said axis of relative rotation, and

providing from said instrument output signals and the known dimensions of the reference body, an output signal representative of the mean radius of curvature of the curved surface of the component under test by computing the value of the expression

$$R_c = R_2 + (L_c - L_s) + (R_c - R_s)/M$$

where:

R_c is the mean radius of the component under test

R_s is the mean radial separation of the surface of the reference body from the instrument at the two points detected

$(L_c - L_s)$ is the change in the instrument output signal upon substitution of the component for the reference body

R_c is the radius of the least squares reference circle computed from the pick-up output signal upon traversing the component

R_s is the radius of the least squares reference circle computed from the values of the pick-up output signal at the said two diametrically opposite points on the reference body

and M is the magnification of the instrument.

4,070,763

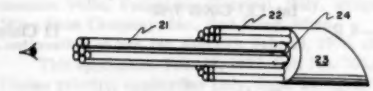
AIMING/SIGHTING DEVICE

Stanley L. Carts, Jr., Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 3, 1976, Ser. No. 747,132

Int. Cl.² F41G *1/32, 1/02*

U.S. Cl. 33—241 **7 Claims**



1. An aiming device comprising:

at least two bundles of straight parallel light collimating fibers having normal ends with diameters which are orders of magnitude less than their lengths, the fibers in each bundle being equal in length and the fibers in each bundle having a length to diameter ratio different from the fibers in every other bundle; and

an illumination means attached to said bundles to illuminate one end of the fibers in each bundle with light of one color, the colors for adjacent bundles being different.

4,070,764

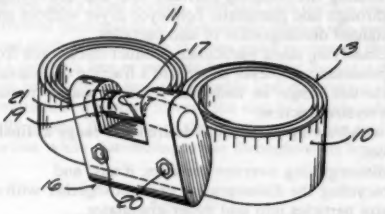
LEVEL AND COLLAPSIBLE RULER

Daniel P. Rohlinger, W220 N3197 Springdale Road, Pewaukee, Wis. 53072

Filed Dec. 10, 1976, Ser. No. 749,600

Int. Cl.² G01C *9/18*

U.S. Cl. 33—342 **3 Claims**



1. A combination collapsible ruler and level comprising a coilable spring strip having a formed concave, convex cross-section and spaced edges permanently stressed to form a plurality of tightly wound convolutions when the stressed strip is collapsed and a linear ruler when uncoiled, an arcuate level tube, and mounting means for mounting said level tube on said spring strip intermediate the ends of the strip and said mounting means having a convex surface complementary to said concave strip surface and having a foot portion for engaging a supporting surface at a point spaced from the lower edge of the strip to cooperate with one of said strip edges to provide bipodal support for the strip and level when in an uncoiled condition so that a plane through the tube arc is normal to the surface upon which said strip and level combination are supported.

4,070,765

PROCESS AND APPARATUS FOR CONVERTING A SOLUTION OR SUSPENSION INTO A DRIED PARTICULATE, GRANULATE PRODUCT

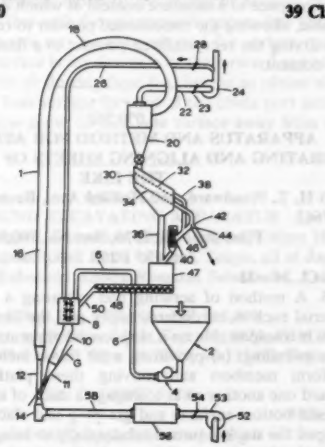
Svend Hovmand, Horsholm, and Erik Liborius, Charlottenlund, both of Denmark, assignors to Aktieselskabet Niro Atomizer, Soborg, Denmark

Filed Apr. 26, 1976, Ser. No. 680,058

Claims priority, application United Kingdom, Apr. 26, 1975, 17431/75

Int. Cl.² F26B *3/08;* F27B *15/00*

U.S. Cl. 34—10 **39 Claims**



1. A process for converting a solution or suspension including recycled material into a dried particulate product in a

material cycling system including a pneumatic conveyor dryer and a mixer-granulator, said process comprising:

a. mixing in said mixer-granulator, the solution of suspension with recycled material consisting of dried particulate material of smaller particle size than the desired final product, to obtain particles of a higher moisture content than that of the desired final product,
b. feeding the resulting particles into and conveying them through said pneumatic conveyor dryer without any substantial disintegration of said particles,
c. classifying dried particulate product discharged from the pneumatic conveyor dryer into a fraction of desired particle size range, an undersize fraction, and, if present, an oversize fraction,
d. withdrawing particles of desired size range as final product,
e. disintegrating oversize particles, if any, and
f. recycling the disintegration product together with undersize particles into said mixer-granulator.

4,070,766

METHOD AND APPARATUS FOR PREPARING A SO-CALLED NON-CAKING POWDER

Gerrit George Kamphuis, Gorredijk, Netherlands, assignor to Stork Friesland B.V., Gorredijk, Netherlands

Filed Sept. 9, 1976, Ser. No. 722,054
Int. Cl.² F26B *7/00, 19/00*
U.S. Cl. 34—12 **5 Claims**

1. A method for preparing a non-caking powder from a concentrate comprising spray-drying a concentrate having a minimum dry solids content of 48% at a temperature above 60° to form a powder having a moisture content below that at which crystallization is possible, cooling the powder to a temperature below 35° C., remoistening the cooled powder in a separate space to a moisture content at which crystallization is possible, allowing the remoistened powder to recrystallize and then drying the recrystallized powder to a final desired moisture content.

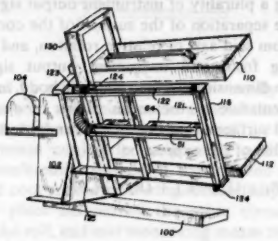
4,070,767

APPARATUS AND METHOD FOR AERATING, VIBRATING AND ALIGNING SHEETS OF PAPER AND THE LIKE

Cyril H. T. Woodward, 160 Howard Ave., Rochelle Park, N.J. 07662

Filed June 29, 1976, Ser. No. 700,840
Int. Cl.² F26B *5/00*
U.S. Cl. 34—33 **25 Claims**

25. A method of aerating and vibrating a stack of sheet material such as cardboard, paper and the like in which the stack is transportable on a skid to said apparatus, said method steps including: (a) providing a lift frame including a pair of platform members and moving these platform members toward one another so as to engage a stack of sheets on its flat top and bottom surfaces and grasping said stack and when so grasped the stack is turned substantially to bring the stack to a vertical edgewise condition and after turning, moving the platforms apart sufficiently to permit aerating and vibrating of the loosened stack of sheets; (b) providing a side support frame carried by the lift frame and moving the frame to a position whereat one edge of the stack is supported and is aligned; (c) providing and cycling a vibrator support frame and carrying this support frame on the side frame and moving the frame back and forth at a selected and determined speed; (d) positioning at least one vibrated shoe carried on a support structure and moving this shoe and structure in a common plane and line which is substantially coincident with a plane normal to the bottom supported edge of the sheet as provided by the side support frame; (e) vibrating the movable shoe in a controlled direction and amplitude and toward and away from the side frame and forming the vibrated shoe with a flat support surface at that portion which is brought into engagement with the supported edges of the stack of sheets when the stack is lifted and turned and agitating the sheets as the air is blown therebetween without a lifting of the sheets from the vibrated shoe above the support surface provided by the side support frame; (f) mounting a spring at such an angle that these springs are disposed to carry the shoe during the vibrating of this shoe and



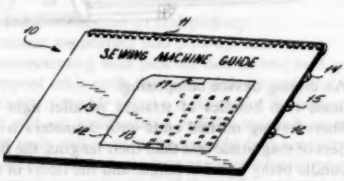
during vibration to carry and move locally the sheets in association with the shoe to a stop surface provided on the side frame; (g) mounting on the shoe a vibrator having a cycle and amplitude adjusting means and carrying said vibrator on said shoe so that the imposed vibrations are in a plane substantially parallel to the plane of the sheets in the stack; (h) providing and carrying an air conduit so as to be movable with the vibrator frame, this air conduit supplied with a large volume of low pressure air and disposed to feed this air to the vibrated shoe; (i) forming air passageways at and in the carrying surface of the shoe and connecting these air passageways to the conduit so that a large volume of low pressure air from the conduit is supplied to these passageways, and (j) forming a plurality of air outlets in the carrying surfaces of each shoe, each of the outlets so formed and positioned as to direct a stream of pressurized air upwardly and locally to and through the stack of sheet material as and after the platform members holding this material are loosened to allow vibrating and aerating of the sheets.

4,070,768

INFORMATION LOCATING SYSTEM AND METHOD

Irving Zuckerman, 19 Lyons Place, Larchmont, N.Y. 10538

Filed May 19, 1976, Ser. No. 687,912
Int. Cl.² G09B *3/00*
U.S. Cl. 35—8 R **12 Claims**



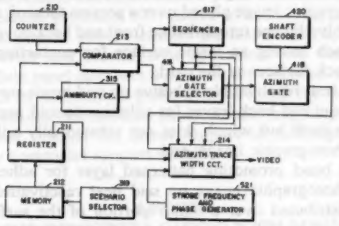
1. A system for locating information in an information bank, comprising an index and a key for the index, the index comprising an integral sheet not part of the information bank and

bearing an array of indicia identifying the locations of information in the information bank and the key comprising a card having an array of closed windows which are registrable with the array of indicia, the key bearing legends for guiding a person to open a particular one or more of said windows depending upon the information which is to be located in the information bank and the windows not bearing any legends, the at least one window which is accordingly opened registering with indicia identifying the location of the information which is to be located in the information bank when the array of windows is registered with the array of indicia.

4,070,769
DIGITAL RADAR TARGET GENERATOR

Ernest E. Hollis, Bedford, Mass., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed July 26, 1976, Ser. No. 708,656
Int. Cl.² G01S *9/00*
U.S. Cl. 35—10.4 **11 Claims**



1. A radar target generator for displaying targets on the display of a radar system having a clock the counts of which indicate a plurality of points on said display, said generator comprising

storage means storing individual target scenarios, each scenario including a plurality of target display numbers each of which indicates one of said plurality of points,

first means for selecting one or more individual target scenarios and interleaving the display numbers of the selected ones of said individual target scenarios when more than one scenario is selected to produce a composite target scenario,

read out means for selecting sequential ones of said display numbers in said composite target scenario, and

a comparator individually comparing said sequentially selected display numbers with the counts of said clock and providing a signal causing a target trace on said display whenever there is a match between said clock count and said display numbers.

4,070,770
INSOLE FOR ROCK CLIMBING SHOE

Francesco Vello, Venegazzu (Treviso), Italy, assignor to Red Wing Shoe Company, Inc., Red Wing, Minn.

Continuation of Ser. No. 660,133, Feb. 23, 1976, abandoned.
This application Feb. 15, 1977, Ser. No. 768,848
Claims priority, application Italy, Sept. 19, 1975, 2432/75
Int. Cl.² A43B *13/38*
U.S. Cl. 36—43 **6 Claims**

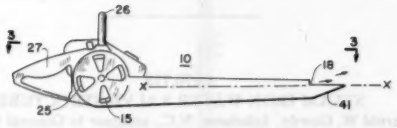
1. In combination with a shoe used for rock climbing applications in which differentiated flexibility of a sole thereof in a longitudinal direction with a maximum of rigidity in a heel portion thereof and a maximum of flexibility in a toe portion thereof is desired to facilitate purchase of said sole with minimum lean-out, such differentiated flexibility traditionally being accomplished by a metal plate incorporated into said heel portion, the improvement which comprises:

an insole formed of a unitary piece of synthetic plastic material replacing said metal plate, said insole having a heel portion and a front portion, with said heel portion being of sufficient thickness to be substantially rigid in use, and said front portion underlying the toes and a portion of the ball of a wearer's foot in use, said front portion having a thickness substantially linearly variable and decreasing in the longitudinal direction toward the toes to provide substantially greater flexibility of the front portion than said heel portion while distributing stress throughout its length.

4,070,771
PORTABLE SNOW BLOWER

John Yakiwchuk, Edmonton, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Nov. 9, 1976, Ser. No. 740,189
Int. Cl.² E01H *5/02*
U.S. Cl. 37—53 **1 Claim**



1. A portable snow blower unit fitted with a housing enclosing a powered blower, said housing formed as a chute for enclosing exhaust air from the blower to a port at the forward end of the housing, in which

the forward end of the housing is formed with an open port section extending across the forward end and forward upper end of the housing, with the bottom forward end section of the housing, below said port section, externally extending as a flat surface towards the forward end of the housing,

said flat surface oriented at an acute angle taken from the port opening, to the axis of the chute of the housing, and at an obtuse angle to the remainder of the undersurface of the housing to the rear of said flat surface, together with a handle externally mounted on an upper section of the housing, so that with the unit manually gripped by the said handle, the unit may be slid with said flat surface resting on a base surface in the direction of the forward end of the housing with air flowing from the chute at an obtuse angle to the said base surface forward of the chute port section so as to blow snow on said base surface away from said port.

4,070,772
GROUND EXCAVATING APPARATUS

Mitsuteru Motomura, Kamakura; Chiaki Kojima, Tokyo; Hiroshi Ohta, Chigasaki, and Akira Nemoto, Tokyo, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Sept. 24, 1975, Ser. No. 616,290
Claims priority, application Japan, Sept. 30, 1974, 49-111409; Sept. 30, 1974, 49-111410; Sept. 30, 1974, 49-111411; Sept. 30, 1974, 49-111408
Int. Cl.² E07F *3/76*
U.S. Cl. 37—117.5 **8 Claims**

1. A ground excavating apparatus comprising

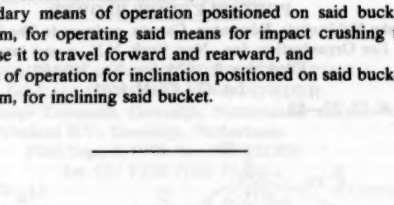
a supporting member,

a bucket boom fitted on said supporting member such that it travels in the forward and rearward directions,

a bucket fitted on the top end section of the bucket boom

such that it can be inclined with respect to the boom, said bucket having a plurality of flukes on the forward end thereof,

means for impact crushing housed in said bucket boom and capable of traveling in the forward and rearward directions,



primary means of operation positioned on said supporting member, for operating said bucket boom for causing it to travel forward and rearward,

secondary means of operation positioned on said bucket boom, for operating said means for impact crushing to cause it to travel forward and rearward, and

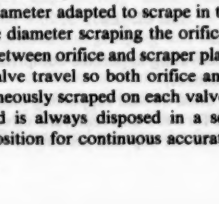
means of operation for inclination positioned on said bucket boom, for inclining said bucket.

4,070,773

STEAM IRON WATER VALVE STRUCTURE

Harold W. Gowdy, Asheboro, N.C., assignor to General Electric Company, Bridgeport, Conn.

Filed Oct. 7, 1976, Ser. No. 730,378
Int. Cl.² D06F 75/06
U.S. Cl. 38—77.83 **5 Claims**



1. In a steam iron having a water tank, steam generating soleplate, a guided water valve with a stem and metering rod portion movable between an on-off position and an outlet duct from the tank having a recess and extending below said valve directing water to the soleplate for steam generation, the improvement comprising:

a thin stainless steel sheet metal cup-shaped plate with a flanged rim overlying the duct and an upwardly-domed bottom with an orifice in the dome;

said flange fixedly nesting the plate in the duct above the recess bottom;

a separate floating centrally-apertured thin stainless steel scraper plate in the recess below the cup-shaped plate;

said metering rod portion carried by the stem and having dual diameters with the rod continuously protruding through said orifice;

the small diameter adapted to scrape in the plate aperture and large diameter scraping the orifice;

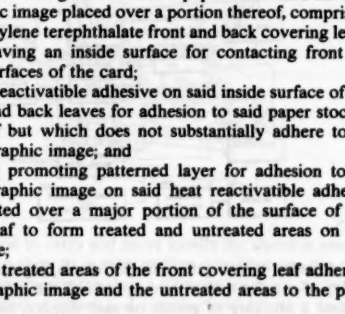
the distance between orifice and scraper plate being less than the total valve travel so both orifice and small diameter are simultaneously scraped on each valve operation and a scraped rod is always disposed in a scraped orifice in valve-on position for continuous accurate control.

4,070,774

IDENTIFICATION CARD POUCH

Henry N. Staats, Deerfield, and Jerome J. Wiermanski, Elmhurst, both of Ill., assignors to General Binding Corporation, Northbrook, Ill.

Filed Aug. 16, 1976, Ser. No. 714,407
Int. Cl.² G09F 3/02
U.S. Cl. 40—2.2 **21 Claims**



1. A card covering for use with a paper stock card having a photographic image placed over a portion thereof, comprising:

a. polyethylene terephthalate front and back covering leaves each having an inside surface for contacting front and back surfaces of the card;

b. a heat reactivatible adhesive on said inside surface of said front and back leaves for adhesion to said paper stock or to itself but which does not substantially adhere to the photographic image; and

c. a bond promoting patterned layer for adhesion to the photographic image on said heat reactivatible adhesive distributed over a major portion of the surface of said front leaf to form treated and untreated areas on said adhesive;

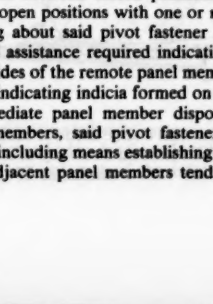
wherein the treated areas of the front covering leaf adhere to the photographic image and the untreated areas to the paper stock card.

4,070,775

ROAD EMERGENCY SIGN

John Doyle Brooks, Rte. 4, Batesville, Ark. 72501

Filed Nov. 5, 1976, Ser. No. 739,344
Int. Cl.² G09F 11/06
U.S. Cl. 40—492 **4 Claims**



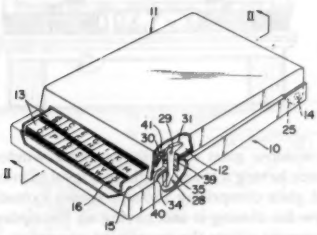
1. A road emergency sign including at least three elongated panel members of substantially the same plan shape and size and having first and second sets of corresponding ends, pivot fastener means pivotally securing said first set of ends together with said panel members spaced apart and relatively swingable in parallel planes between closed positions in registry with each other and open positions with one or more of said panel members swung about said pivot fastener means relative to each other, and assistance required indicating indicia formed on the remote sides of the remote panel members and required assistance type indicating indicia formed on the opposite sides of each intermediate panel member disposed between said remote panel members, said pivot fastener means and said panel members including means establishing a friction connection between adjacent panel members tending to frictionally

retain said panel members in adjusted relatively angularly displaced positions, said indicia on said remote panel members comprising word forming indicia spaced therealong and readable from top to bottom when said remote panel members are disposed in upstanding position with their second ends uppermost, said indicia on said intermediate panel members comprising word forming indicia spaced therealong and readable from left to right when said intermediate panel members are horizontally disposed, the indicia on the opposite sides of each of said intermediate panel members being relatively reversed, end-to-end, said remote sides of said remote panel members being at least substantially fully uncovered for viewing of the indicia thereon at all times, independent of the adjusted angular positioning of said remote panel members remote to each other and the intermediate panel members, said panel members including corresponding opposite end edges and corresponding opposite side edges, the end edges of said remote panel members at said first set of corresponding ends and at least one set of said corresponding side edges of the intermediate panel members being positionable in substantially coplanar relation when said remote and intermediate panel members are angularly displaced generally 90° relative to each other, whereby when said remote panel members are disposed in upstanding position with said second ends uppermost and one of said intermediate panel members is horizontally disposed, the lower end edges of said remote panel members and the lower side edge of said one intermediate panel member may be positioned in coplanar relation for direct support of said sign from a generally horizontal support surface.

4,070,776
TABLETOP DIRECTORY CASING WITH MEANS FOR READY ACCESS TO DESIRED ENTRIES

Yoshio Mitsuhashi, 79, Higashi-Kibogaoka, Asahi, Yokohama, Kanagawa, Japan

Filed Sept. 1, 1976, Ser. No. 719,452
Claims priority, application Japan, Sept. 9, 1975, 50-108563; Apr. 27, 1976, 51-47269
Int. Cl.² B42F *17/18*
U.S. Cl. 40—381 **11 Claims**



1. A directory casing comprising a base adapted to support on its top a stack of cards each having a tab projecting forwardly therefrom, said top of the base including a resiliently supported front end portion which is depressible by manual force exerted on any of the tabs of the cards thereon, a top cover pivotally coupled at its rear end to the base and adapted to be closed over the cards thereon so as to leave their tabs exposed, spring means biasing the top cover in an opening direction, engaging means for normally locking the top cover in a closed position against the bias of the spring means and, upon exertion of manual force on a selected one of the tabs, for permitting the top cover to open with the card or cards, if any, overlying the card having the selected tab, and stationary card-declining means provided on the top of the base and arranged rearwardly of the resiliently supported front end portion thereof to support the cards on the top of the base in rearwardly declining disposition, whereby upon exertion of manual force on a selected one of the tabs, a sufficient spacing can be formed between the front end portions of the card having the selected tab and the card lying immediately thereover.

4,070,777
BUBBLER DISPLAY DEVICE AND METHOD OF MAKING SAME

Joseph C. Lo Giudice, 5400 W. Montrose Ave., Chicago, Ill. 60641

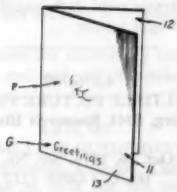
Filed Sept. 30, 1976, Ser. No. 728,040
Int. Cl.² G09F *13/24*
U.S. Cl. 40—406 **10 Claims**

1. A display device for generating a continuous flow of bubbles through a body of liquid, said device comprising, an elongated vertically disposed transparent tube evacuated of air, a translucent glass chamber arranged at the lower end of and within said tube, said chamber being closed at its upper end and open at its lower end, a body of liquid in the tube covering and extending above said chamber, some of said liquid entering the lower end of said chamber, electric heater means within said chamber for heating liquid entering thereinto and discharging gaseous bubbles therefrom into the transparent tube and wire means supporting said heater and chamber within said tube.

4,070,778
GREETING CARD

Harry H. Mahler, 284 Main St., Centerville, Mass. 02632, and John A. Spargo, Crosby Lane, East Brewster, Mass. 02631

Filed Apr. 12, 1976, Ser. No. 676,357
Int. Cl.² G09F *1/00*
U.S. Cl. 40—124.1 **1 Claim**



1. A greeting card comprising first and second sections with the first section folded over the second section, the junction of the two sections having a score line extending from end-to-end thereof to enable the first and second sections to be easily separated, the exposed face of the first section having a picture printed thereon and its other face having a space for an address

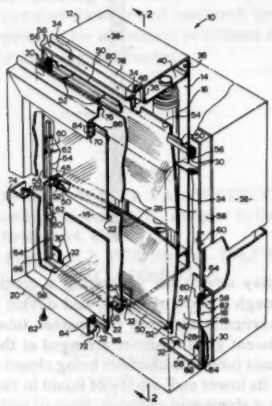
and a space for a message and at least a part of the back face of the second section includes a coat of a pressure-sensitive adhesive enabling said card to be removably secured thereby to a vertical display surface, the first section when later detached useable as a postcard and having a message printed on the exposed face of the first section adjacent the bottom edge thereof and below the picture, and the first section having a transverse score line extending from the free side edge thereto to said first named score line and enabling the message area to be separated from the picture area.

4,070,779

DISPLAY SIGN

Ralph M. Gilmour, Montreal, Canada, assignor to Claude Neon Industries Limited, Toronto, Canada

Filed Aug. 30, 1976, Ser. No. 718,667
Claims priority, application Canada, Sept. 2, 1975, 234746
Int. Cl.² G09F *13/04*
U.S. Cl. 40—575 **13 Claims**



1. A display sign for displaying printed matter on a poster or the like comprising:

a display case defining a first compartment adapted to contain a light source, the display case having a front opening for the transmission of light therethrough and a closure panel adapted to cover said opening, the closure panel having a central transparent face panel;

a concave translucent diffuser panel located between said face panel and said light source, the curvature of said concave diffuser panel extending toward the light source to define a second compartment between the diffuser panel and a face panel; and

releasable fastening means for locating said poster in the second compartment spaced between the face panel and the concave diffuser panel, so that the poster is viewed through the transparent face panel and may be backlighted by the light source.

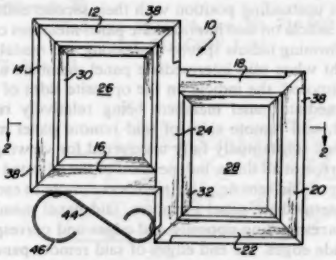
4,070,780

MULTIPLE PICTURE FRAME

Harry W. Rosenberg, 8941 Roosevelt Blvd., Philadelphia, Pa. 19152

Filed Oct. 26, 1976, Ser. No. 735,467
Int. Cl.² G09F *1/12*
U.S. Cl. 40—152 **10 Claims**

1. A multiple picture frame comprising first and second sets of peripheral border members and a common central border member all having a major face lying in a common plane, each set of border members being U-shaped with each of its ends connected to said central border member, one of the legs of each set of border members being longer than the other leg and generally perpendicular to said central border member, said sets of border members being vertically offset from each other to define at least two picture openings offset from one another, a molding secured to the inner periphery of each set of border



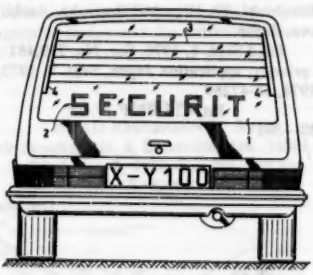
members, each set of molding being offset with respect to a rear face of said border members to define a picture recess slightly larger than said picture openings, a means on the rear face of said frame to facilitate mounting the frame.

4,070,781

WINDOWS BEARING AN INSCRIPTION

Gerd Sauer, Aachen-Laurensberg, Germany, assignor to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed Nov. 5, 1976, Ser. No. 739,096
Claims priority, application France, Nov. 13, 1975, 75 34573
Int. Cl.² G09F *13/12*
U.S. Cl. 40—219 **9 Claims**



1. In a window glass extending across a window into an interior space having a lower brightness level than outside said space, said glass comprising the sole means extending across the window for closing it and having an inscription thereon, the improvement where the inscription comprises:

a. a semi-reflective, transparent layer applied to the surface of said glass.

4,070,782

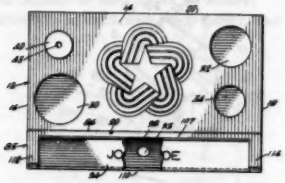
DESK ORNAMENT

Sergio A. Vasallo, 850 S. Miami Ave., Miami, Fla. 33130

Filed Sept. 13, 1976, Ser. No. 722,492
Int. Cl.² G09F *7/04*
U.S. Cl. 40—323 **1 Claim**

1. A decorative paper weight device comprising a body of relatively dense material having a bottom surface of plane form and an upper surface, said upper surface having a) a plurality of spaced recesses in a pattern, each of said recesses being sized to snugly receive and display the main surface of a coin of a predetermined year, and b) an embossed symbol on the upper surface centrally arranged with respect to said pattern, and c) a recess sized to receive a flag staff; and said body having a front surface, and magnetic means embedded in said front surface and a name tag means companionately sized to cover a

major portion of said front surface and said name tag means including metallic plate means to attach to the magnetic means, whereby the name tag means is removable from said front surface, and said name tag means comprises a block sized to extend across the front surface between the upper and lower surface of the paper weight device and said tag means includes



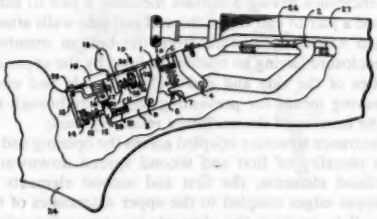
an inclined front surface extending downwardly from the level of said upper surface toward said outer surface and outwardly away from said front surface and comprising an inclined surface and a name tag plate sized and fitted on the inclined surface and means removably mounting said plate on said inclined surface.

4,070,783

THUMB TRIGGER AND AUTOMATIC SAFETY

Walter William Edwards, Rte. No. 1, Box No. 265, Bruno, Minn. 55712

Filed Dec. 29, 1976, Ser. No. 755,488
Int. Cl.[2] F41C *19/04, 17/02*
U.S. Cl. 42—69 R **10 Claims**



1. A thumb trigger and automatic safety comprising: a partially enclosed casing having four tabs for locating two pivot points thereon, a swinging large arm pivoted about a pivot pin and secured thereby between two of said tabs near the front of said casing, said large arm having a clearance hole at said pivot point for receiving said pivot pin therein, said large arm having a radius slot therein for receiving a strike from a roller bearing, said large arm having a pin extending upwardly therefrom into a vertically oriented cylindrical tube containing a compression spring, said large arm extending toward the front end of the partially enclosed casing, said large arm having an angled bend at one end thereof for engaging a firing striker, and means for mounting said casing in a firearm for actuation by a thumb trigger.

4,070,784

ELECTRIC FISHING FLOAT

Seiji Yokogawa, Moriguchi, and Kiyoshi Takenaka, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed July 13, 1976, Ser. No. 704,816
Claims priority, application Japan, July 15, 1975, 50-98562[U]; July 15, 1975, 50-98563[U]; Dec. 17, 1975, 50-171752[U]; Dec. 17, 1975, 50-171753[U]
Int. Cl.[2] A01K *85/01*
U.S. Cl. 43—17.5 **6 Claims**

1. An electric fishing float characterized by the provision of
a. an elongated tubular fishing float case consisting of an upper case section with a light source positioned therein adjacent a closed top end thereof and a lower case section water-tightly connected to said upper case section,
b. a cell disposed within said lower case section and having an electrode axially upwardly extended from the top thereof, the shell of said cell serving as another or opposite electrode,
c. a tubular insulating member having the upper portion thereof water-tightly fitted into the lower portion of the hole of said upper case section,
d. a pair of contact members securely held in position between said tubular insulating member and a core member inserted into said tubular insulating member, said core member comprising a large diameter cylindrical base section with a cylindrical cavity having an open lower end, said cell being disposed in said cylindrical cavity, and an elongated small diameter cylindrical section axially upwardly extended from said large diameter cylindrical base section coaxially thereof, said tubular insulating member being fitted over said elongated small diameter cylindrical section with said pair of contact members interposed therebetween.
e. electrical connection means disposed within said core member for making electrical connection between one of said pair of contact members and said axially upwardly extended electrode of said cell and between the other contact member and the shell or opposite electrode of said cell, and
f. a pair of lead wires for electrically connecting between said light source and said pair of contact members.

4,070,785

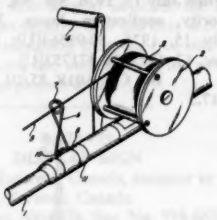
FISHING LINE GUIDE DEVICE

Cortez Hawk, 2214 Sycamore, Anaheim, Calif. 92806

Filed June 29, 1976, Ser. No. 700,772
Int. Cl.[2] A01K *87/04*
U.S. Cl. 43—24 **4 Claims**

1. A fishing line guide device comprising:
a. a base coil comprising a coiled metal rod portion and straight metal rod portions on either side of said coiled portion;
b. a line guide removably attached to said base coil com-

prised of a looped metal rod having straight portions on either side of a looped portion and end portions at approximately 90° to the straight portions, with the line guide having the shape so that the said end portions can be



inserted within the coil of the base coil and pivotable about said coil; and

c. means for attaching the straight metal rod portions of the base coil to a fishing rod.

4,070,786

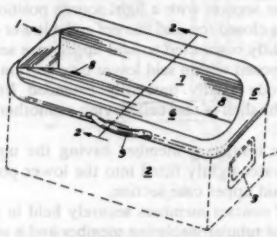
FISH RECEIVING HOPPER

James M. Dunham, 119 Kaffie Drive, Natchitoches, La. 71457

Filed Dec. 6, 1976, Ser. No. 747,496

Int. Cl.² A01K *97/04*

U.S. Cl. 43—55 **12 Claims**



1. A fish receiving hopper for use with a fish storage container comprising a shell-like cover, a downwardly extending chute disposed in the top of said shell-like cover and having a bottom terminus edge, and a substantially vertically oriented door having the top edge hinged to said shell-like cover and the bottom edge normally co-extensive with and adjacent said bottom terminus edge of said chute in closed configuration, whereby when a fish is caused to slide down said chute and contact said door, said door is displaced from said bottom terminus edge and swings open to permit said fish to fall into said storage container and returns to said closed configuration by operation of gravity after passage of said fish.

4,070,787

RODENT TRAP

George W. Oakes, Crystal Heights, Crystal City, Mo. 63019

Filed Sept. 10, 1976, Ser. No. 722,193

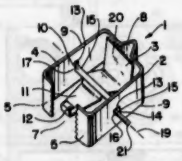
Int. Cl.² A01M *23/24, 23/26*

U.S. Cl. 43—94 **10 Claims**

1. Rodent trap apparatus which comprises

a unitary resilient frame having an intermediate portion and a pair of opposed coacting rodent-gripping end jaws movable with respect to each other between a spaced apart cocked position and a closed position and normally resiliently biased to closed position under sufficient snap force to grip a rodent disposed therebetween, and

a rodent-trippable unitary spacer trigger operatively interposed interengagingly with the frame to permit unhindered relative movement of the jaws with respect thereto between such positions and having a rockingly releasable slip catch portion arranged for temporarily maintaining the jaws in the spaced apart cocked position against the biasing force of the frame and a cooperating selectively counterbalanced rockable bait-carrier tripper portion



which is selectively counterbalanced to permit the slip catch portion to normally maintain the jaws in cocked position and arranged in the vicinity of the jaws and accessible to a rodent thereat for tripping the spacer trigger to release the slip catch portion and close the jaws under snap force to grip such rodent.

4,070,788

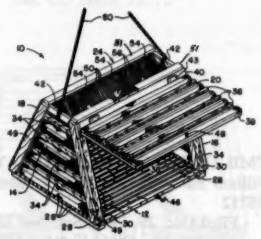
PRAWN TRAP

Harry G. Richcreek, 1098 H St., Crescent City, Calif. 95531

Filed Sept. 13, 1976, Ser. No. 722,892

Int. Cl.² A01K *69/00*

U.S. Cl. 43—100 **10 Claims**



1. Apparatus for entrapping prawns, comprising:

an enclosure having a bottom member, a pair of side walls and a pair of end walls, the end and side walls attached to and extending upward from the bottom member, said enclosure having an opening defined by the upper extremities of the side and end walls, the side and end walls having means for preventing light therethrough to keep the interior of the enclosure relatively dark;

an entrance structure coupled across the opening and having a plurality of first and second spaced downwardly inclined elements, the first and second elements having upper edges coupled to the upper extremities of the side wall to position the elements in converging relation to each other, a major portion of the first elements interlaced with the second elements at the lower ends thereof, certain of the first elements being shorter than adjacent first elements to define spaced, prawnreceiving openings in said entrance structure.

4,070,789

FOLDING DOLL HOUSE

Ellene S. Levenson, 23930 Killion St., Woodland Hills, Calif. 91364

Filed Aug. 30, 1976, Ser. No. 718,958

Int. Cl.² A63H *33/00*

U.S. Cl. 46—12 **7 Claims**

1. A folding doll house comprising:

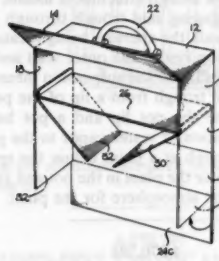
an upper structure having top, bottom, back, front and side

panels coupled to form a box-like structure, said front panel being coupled only to said top panel;

a plurality of lower side walls;

means coupling said lower side walls to said upper structure at the lower side edges thereof, whereby said lower side walls are adapted to fold to lie adjacent to said bottom panel outside of said upper structure;

a foldable lower back and floor panel; and



means coupling said lower back and floor panel to said upper structure at the bottom rear edge thereof, whereby said lower back and floor panel is adapted to fold to lie adjacent to said lower side walls outside of said upper structure and adjacent said front panel within said upper structure,

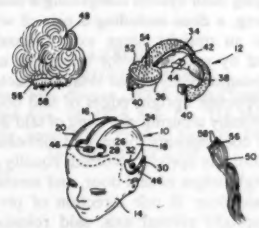
whereby the lower side walls and the lower back and floor panel of said dollhouse may be folded adjacent to said upper structure.

4,070,790

DOLL WITH RELEASABLY-ATTACHED HAIR PIECES

Ned Strongin, Baldwin, and Isabel Garrett, New York, both of N.Y., assignors to Ned Strongin Associates, Inc., New York, N.Y.

Filed June 15, 1976, Ser. No. 696,406
Int. Cl.[2] A63H *3/44*
U.S. Cl. 46—172 10 Claims



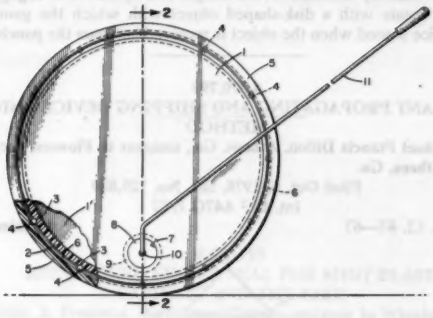
1. A doll adapted to receive interchangeable hair pieces, said doll comprising a doll head having a crown portion and a permanent wig formed of hair filaments covering said crown portion, hair piece mounting means secured to said doll head and having enlarged portions located at the front center and sides of said crown portions, an auxiliary hairpiece, and self-adhering fastening means including complementary hook and hook-engaging surfaces on said enlarged portions and said auxiliary hair piece for releasably attaching said hair piece to a selected enlarged portion, the hair filaments of said permanent wig overlying and concealing said enlarged portions and said auxiliary hair piece being removably attachable to said doll head by pressing the fastening means surface of said auxiliary hair piece against the fastening means surface on a selected enlarged portion through the hair filaments overlying the latter.

4,070,791

WHEEL TOY

J. D. Franklin Dill, Rte. 6, Box 37, Jasper, Ala. 35501

Filed Aug. 18, 1976, Ser. No. 715,555
Int. Cl.[2] A63H *33/02*
U.S. Cl. 46—220 2 Claims



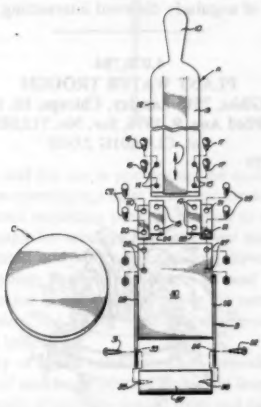
1. A push or pull toy consisting of a hollow cylinder, two circular discs mounted on either end of said cylinder, said cylinder having a plurality of equally spaced hemi-cylindrical grooves in the outer periphery thereof, a roller bearing seated within each groove, a tire concentrically positioned outside of said cylinder, said tire having an inner peripheral groove to form a race for said bearings and being spaced from said cylinder a distance equal to the diameter of the roller bearings minus the depth of the grooves and means to push or pull said toy eccentrically attached to said discs.

4,070,792

GAME DEVICE FOR LAUNCHING AND PUSHING A ROLLING WHEEL

John M. Vuyovich, 1369 McDuff St., Los Angeles, Calif. 90026

Filed Apr. 21, 1976, Ser. No. 678,864
Int. Cl.[2] A63H *33/02*
U.S. Cl. 46—220 4 Claims



1. A game device for use with a disk-shaped object comprising the combination of an elongated member having a portion at one end thereof adapted to be held by hand and a groove extending along part of the length of the member between said portion and the other end thereof, said groove being configured to permit a disk-shaped object to roll along the length thereof, a pair of panels mounted on the member at said other end thereof and on opposite sides of the groove, said panels being parallel and spaced apart from each other by a distance

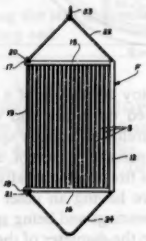
greater than the width of a disk-shaped object with which the game device is used, the panels being operative to guide the disk-shaped object when the object is rolled along the length of the elongated member and to engage the sides of the object to turn the object after launching from the elongated member and when rolling along the ground, and a roller extending between and rotatably mounted on the flanges and operative to engage and rotate with a disk-shaped object with which the game device is used when the object is received between the panels.

4,070,793

PLANT PROPAGATING AND SHIPPING DEVICE AND METHOD

Michael Francis Dillon, Athens, Ga., assignor to Flowers, Inc., Athens, Ga.

Filed Oct. 6, 1976, Ser. No. 729,889
Int. Cl.² A47G *7/02*
U.S. Cl. 47—67 **4 Claims**



1. A plant propagating open ended hollow sleeve comprising top, bottom and side walls interconnected along their side edges to form a tubular structure, the height of said side walls being slightly in excess of the diameter of the stems of cuttings used in propagating plants from such cuttings and said top and bottom walls being considerably wider than the height of said side walls, and a plurality of longitudinally aligned apertures formed in each of said side walls for receiving the stems of a plurality of cuttings respectively, each of said apertures comprising a pair of angularly disposed intersecting slits.

4,070,794

PLANT WATER TROUGH

Geraldine L. Gibbs, 7515 Langley, Chicago, Ill. 60619

Filed Aug. 9, 1976, Ser. No. 712,587
Int. Cl.² A01G *27/00*
U.S. Cl. 47—79 **1 Claim**

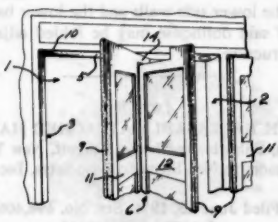
1. A plant water trough, comprising an endless, open-topped trough adapted to contain water and defined by an upstanding, endless relatively tall inner wall of substantially 1¼ inches height, and an upstanding, endless, relatively short outer wall of substantially 1¼ inches height spaced substantially uniformly apart from and outside of the inner wall by substantially 1 inch, the inner wall defining an enclosed space of a size and shape larger than an individual common flower pot, both the outer and inner walls radially extending substantially outside a rim of the flower pot to locate the trough in a position spaced apart from the pot and to permit water in the trough to evaporate and the humid atmosphere created thereby to flow directly upwardly along a path of travel spaced horizontally apart from the outside of the flower pot to the foliage of a plant rooted in the pot, and three suspension means members equiangularly spaced about the trough, each suspension member being attached at one end to a hook for engagement over the pot rim, and at another end to a trough attachment means, said trough attachment means engaging said trough through an aperture formed in said inner wall, the aperture being located at a point vertically above the top rim of the outer wall and below the top rim of the inner wall, and the suspension means being of a length to suspend said trough from a lip of the pot at a level vertically intermediate the pot lip and a pot base, thereby providing a concentration of water vapor to the plant foliage while locating the trough at a point below the space used to observe, work and water the plant in the pot and yet providing an invigoratingly moist atmosphere for the plant.

4,070,795

SWINGING DOOR SYSTEM

Jean Louis Lussier, 91 Francois-Gauthier, Boucherville, Quebec, Canada (J4B 4N5)

Filed Mar. 18, 1976, Ser. No. 668,198
Int. Cl.² E05B *65/10*; E05C *15/02*
U.S. Cl. 49—141 **22 Claims**



1. A swinging door system comprising a door frame having a door opening, a door including a pair of wings hinged together about an upright hinge axis, releasable connection means carried by said wings for releasably maintaining said wings in substantially co-planar relation, each wing defining one of two opposite upright edges of said door respectively, means for pivotally securing one wing of said door to said door frame in said door opening for pivotal movement of said door about an operatively upright pivot axis equally distant from the opposite upright edges of said door, and means urging pivotal closing of said door in one direction of pivotal movement about said upright pivotal axis, said releasable connection automatically releasing said substantially co-planar wings for folding movement of said wings about said hinge axis upon sufficient force exerted on at least the other of said wings in the direction of closing pivotal movement of said door.

4,070,796

METHOD OF PRODUCING ABRASIVE GRITS

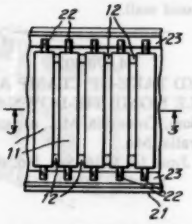
John J. Scott, Niagara Falls, Canada, assignor to Norton Company, Worcester, Mass.

Filed Dec. 27, 1971, Ser. No. 212,614
Int. Cl.² C09C *3/04*
U.S. Cl. 51—309 R **5 Claims**

1. A method for the production of abrasive grain from molten abrasive comprising

pouring said molten abrasive into a plurality of spaces defined by a plurality of relatively cold spaced parallel graphite or metal plates, the geometry of said spaces being such that at least 95% of the surface area of the poured

abrasive in the mold is protected from the atmosphere by an adjacent mold surface during solidification, whereby the abrasive is solidified rapidly without melting of said plates, and



separating the solidified abrasive from said plates and comminuting it.

4,070,797

NITROGEN-FREE ANIONIC AND NON-IONIC SURFACTANTS IN A PROCESS FOR PRODUCING A HAZE-FREE SEMICONDUCT

Rudolf Griesshammer; Helmut Kirschner, and Günther Lechner, all of Burghausen, Germany, assignors to Wacker-Chemitronic Gesellshaft fur Elektronic Grundstoffe mbH, Burghausen, Germany

Filed July 2, 1976, Ser. No. 702,376
Claims priority, application Germany, July 14, 1975, 2531431
Int. Cl.² B24B *1/00*
U.S. Cl. 51—326 **10 Claims**

1. In a process for the production of a semiconductor having a haze-free surface by polishing the semiconductor with a polishing agent containing at least one member of the group consisting of quartz, silica, silicates and fluosilicates, the improvement which comprises further polishing the semiconductor in a second polishing step with a modified polishing agent containing said first-mentioned polishing agent and from 0.1 to 10% by weight, calculated on the weight of said first-mentioned polishing agent, of a nitrogen-free surfactant selected from the group consisting of anionic and non-ionic surfactants and a mixture thereof.

4,070,798

POLISHING WHEELS

Jean Emain, Beau Site. Serger, 39200 Saint-Claude, France

Filed Aug. 18, 1976, Ser. No. 715,284
Claims priority, application France, Aug. 26, 1975, 75 20310
Int. Cl.² B24D *9/06*
U.S. Cl. 51—361 **5 Claims**

1. A polishing wheel comprising a circular rotatable body, a plurality of spaced apart rigid support members provided on the periphery of the rotatable body, a layer of resilient materials provided on the periphery of each said support member and a strip covered with abrasive material supported on each layer of resilient material, the abrasive strip being secured on the support member by means for regulating the tension of said strip, the abrasive strip being an endless abrasive strip which is retained between the downstream end of the support member and a first cylindrical member mounted eccentrically on the body of the polishing wheel, said endless abrasive strip being engaged on a second eccentric cylindrical member and being retained by resilient means.

4,070,799

REINFORCED FINGER SEAL FOR SHOT BLAST CABINETS AND THE LIKE

John A. Pedersen, Burlington, Canada, assignor to Wheelabrator-Frye Inc., Hampton, N.H.

Filed Mar. 9, 1977, Ser. No. 775,893
Int. Cl.² B24C *3/10*
U.S. Cl. 51—426 **5 Claims**

1. A finger seal for use in preventing the escape of particulate through an opening in a blast treatment device comprising:

a. a reinforced mounting portion adapted to receive a bolt therethrough for securing said seal over said opening,

b. an elongated body portion extending downwardly from said mounting portion, the length of said body portion being selected to substantially cover the vertical height of said opening, the width of said body portion being less than said length,

c. a plurality of raised reinforcing ribs provided on at least one side of said body portion along the length dimension thereof, each of said ribs spaced from and running parallel to the remaining ribs, said ribs tapering down and terminating at a point in proximity to the bottom of said body portion,

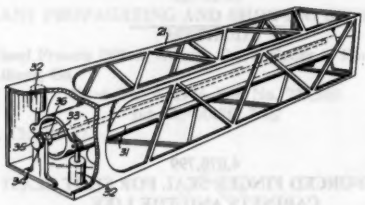
whereby said seal is relatively rigid along the upper and middle body portion due to the raised ribs thereby to deflect particulate and is relatively flexible along the lower body portion due to the termination of the ribs thereby to permit entry of parts into said blast treatment device.

4,070,800

CONTROL OF TORSIONAL DEFORMATION OF ELONGATE MEMBERS

Kenneth Robson Brown, Kirknewton, and Andrew Guy Kerr, Edinburgh, both of Scotland, assignors to Ferranti Limited, Hollinwood, England

Filed Aug. 2, 1976, Ser. No. 710,748
Claims priority, application United Kingdom, Aug. 2, 1975, 32403/75
Int. Cl.[2] E04B 1/36
U.S. Cl. 52—1 13 Claims



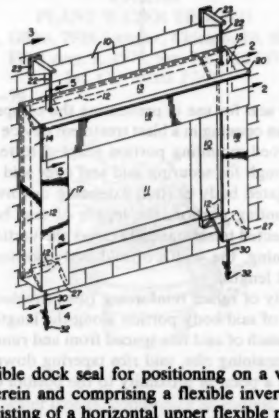
1. Apparatus for controlling the resistance of an elongate member to torsional deformation between its ends comprising a torque transmitting member mounted coaxially with the longitudinal axis of the elongate member and rigidly fixed at one of its ends to the member in a non-rotatable manner relative to the elongate member, the other end of the torque transmitting member being capable of rotation about its axis relative to the elongate member, measuring means operable to measure torsional deformation of the elongate member to produce a control signal indicative of the sense and magnitude of the deformation, and actuating means responsive to the control signal to apply a torque to the other end of the torque transmitting member about the axis thereof in such a sense as to cause the said one end of the elongate member to be rotated relative to the other end thereof to oppose the torsional deformation.

4,070,801

FLEXIBLE DOCK SEAL

Larry O'Neal, 4953 Timbercrest Drive, Canfield, Ohio 44406

Filed Oct. 4, 1976, Ser. No. 729,277
Int. Cl.[2] E04B 1/34, 7/14
U.S. Cl. 52—2 5 Claims



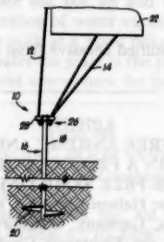
1. A flexible dock seal for positioning on a wall about an opening therein and comprising a flexible inverted U-shaped device consisting of a horizontal upper flexible member and a pair of vertical flexible members positioned one at each end thereof in depending relation thereto, means above said opening positioning said upper flexible member transversely there across in planes generally outwardly and downwardly from the plane of the wall and means at the sides of said opening positioning said vertical flexible members in planes generally outwardly and parallel with the plane of the wall and foldable hinge-like devices positioned between said wall and said flexible members and resilient means attached thereto for normally holding the foldable hinge-like devices in a first position extending outwardly from said wall and movable to a second position adjacent said wall.

4,070,802

SPRING-BIASED TAKE-UP CLAMP ASSEMBLY FOR MOBILE HOME TIE-DOWN STRAPS

James Thomas Odom, Columbia, Mo., assignor to A. B. Chance Company, Centralia, Mo.

Filed June 14, 1976, Ser. No. 695,648
Int. Cl.[2] E04D 1/34
U.S. Cl. 52—23 17 Claims



1. A clamp assembly for securing an element such as an elongated cable or strap to anchoring structure, comprising:

mounting structure presenting first and second engagement surfaces and adapted to be affixed to said anchoring structure; and

axially rotatable spindle means for receiving one end of said element and in engagement with said first engagement surface;

spring means operatively coupling said spindle means and mounting structure for precluding significant loosening of the element under tension loads normally experienced thereby,

said spring means including a first portion in gripping engagement with said spindle means, and a second portion in engagement with said second engagement surface, said mounting structure being located between said spindle means and the part of said second portion in engagement with said second surface, said second spring portion being loaded in tension.

4,070,803

SUPPORTIVE ACCESSORY UNITS FOR MODULAR WALL PANELS

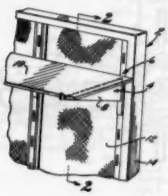
Clifford W. Gartung, 215 Via Dijon, Newport Beach, Calif. 92660

Filed July 6, 1976, Ser. No. 703,085
Int. Cl.[2] A47G 29/02
U.S. Cl. 52—36 13 Claims

1. In combination with a modular wall panel including a rigid frame having a U-shaped channel with at least one peripheral support rim and a compressible panel member mounted in the U-shaped channel frame and bearing on the support rim, the improvement comprising a shelving support assembly including;

a U-shaped support bracket having a plurality of apertures, an elongated side flat force bearing member and an upper horizontal support shoulder extending outward from the side force-bearing member at one end of the U-shaped support bracket, the compressible panel member bearing against the U-shaped support bracket, and the side force bearing member to hold the upper support shoulder against the frame support rim, the side force bearing mem-

ber further extending under an adjacent peripheral support rim and bearing against the edge of the support rim, the shelving support assembly is removably mounted on



the modular wall panel by depressing the compressible panel member and sliding the upper support shoulder onto a horizontal support rim and also by sliding the side force bearing member behind an adjacent vertical support rim.

4,070,804

BUILDINGS ERECTED FROM THREE OR MORE BOX-SHAPED SECTIONS, AND METHODS OF FABRICATING SUCH BUILDINGS

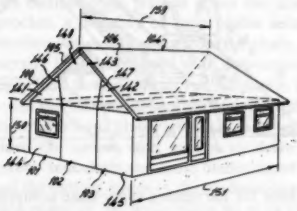
Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

Continuation of Ser. No. 445,924, Feb. 26, 1974, abandoned. This application Nov. 20, 1975, Ser. No. 633,977

Claims priority, application Netherlands, Feb. 28, 1973, 7302761

Int. Cl.² E04H *1/12*

U.S. Cl. 52—64 **34 Claims**



1. A building comprising three or more elongated box-shaped prefabricated sections each of which encloses part of the space of the building, at least one of said sections being located between and connected on its longer side to two further of said sections, said one section having a width of its space-enclosing part exceeding the width of the space-enclosing part of said further sections, said further sections being free of the other said sections on one side, one of said further sections being provided with a top construction which, viewed in plan, projects in a direction of width beyond the space-enclosing part of said one further section, the over-all width of said top construction being substantially equal to the width of the space-enclosing part of said one section, whereby the transport width of said one further section and said one section are substantially equal.

4,070,805

DISPLACEABLE BUILDING UNIT FOR OFF-THE-WALL GAMES

Sid Kastner, 68 Rosemount Crescent, Westmount, Quebec, Canada (H3Y 2C2)

Filed Aug. 16, 1976, Ser. No. 714,847

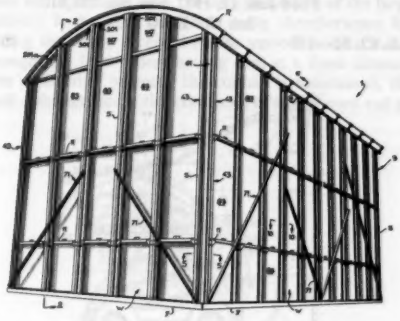
Int. Cl.² E04B *1/32*

U.S. Cl. 52—86 **8 Claims**

1. A displaceable building unit defining a playing enclosure for use as a court for off-the-wall games requiring at least one wall suitable for the bouncing-off of a ball, comprising:

a frame made up of at least one end skeleton structure and two side skeleton structures fixed to said end skeleton structure;

flat wall panels and resilient means securing said wall panels to said structures on the inside thereof with respect to said playing enclosure; said resilient means detachably connecting said panels to said structures at spaced apart locations;



wherein each panel is a cellular construction comprising an inner skin, an outer skin spaced from and parallel to said inner skin, and a plurality of spaced apart webs extending transversely of the panel between said skins, said panels being disposed on said structures so that the outer surface formed by said panel inner skins is unbroken, and

wherein said resilient means detachably securing said panels of said ball-bouncing wall project solely toward the outside of said panels with respect to said playing enclosure whereby the inner face of said ball-bouncing wall is flat, continuous and devoid of projecting parts so as to be suitable for use in an off-the-wall game.

4,070,806

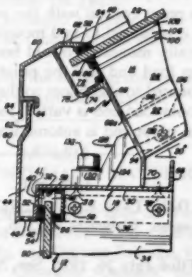
SLOPED CURTAIN WALL STRUCTURE

S. Eugene Hubbard, Niles, Mich., assignor to Kawneer Company, Inc., Niles, Mich.

Filed Mar. 28, 1977, Ser. No. 781,752

Int. Cl.² E04B *7/00*

U.S. Cl. 52—95 **37 Claims**



1. A sloped curtain wall structure for buildings and the like comprising:

an elongated horizontal sill including a bottom wall and at least one upstanding side wall forming a gutter therein,

at least one rafter sloping upwardly of said sill and including a gutter and a glazing pocket for receiving an edge portion of a glazing panel, and

an elongated baffle between the lower end of said rafter and

said sill including a wall portion abutting said rafter end and interlocked with said side wall of said sill to substantially enclose said sill above said gutter thereof,

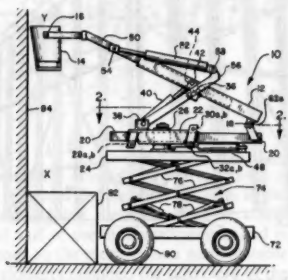
said baffle including a glazing pocket for receiving an edge portion of said glazing panel.

4,070,807

AERIAL LIFT

Raymond E. Smith, Jr., 385 E. Greenwood, Lake Forest, Ill. 60045

Filed Jan. 12, 1977, Ser. No. 758,810
Int. Cl.² E04G *1/22*
U.S. Cl. 52—109 **10 Claims**



9. An aerial lift comprising;

a base;

a vertically adjustable, substantially horizontal mounting table;

a scissors-type elevator system for raising and lowering said table above said base,

a pivotable boom having a load end, an extensible portion adjacent said load end, and a pivot end;

means for mounting said boom to said table so that said boom pivot end is horizontally movable but vertically fixed;

a support arm having one end pivotally mounted to said table, a second end pivotally mounted to said boom, and an extension which extends beyond said boom,

rigid cylinder means pivotally reaching from said support arm extension to said extensible portion of said boom for automatically extending and retracting said extensible portion of said boom; and

a pivot cylinder for raising and lowering said boom, one end of said pivot cylinder pivotally mounted to said mounting table at a point coaxial with the point at which said support arm is mounted to said mounting table and the other end pivotally mounted to said boom at a point between said boom load end and the point at which said support arm is mounted to said boom so that as the vertical portion of said boom load end is varied, the horizontal position of said boom pivot end is automatically adjusted.

4,070,808

ADJUSTABLE WALL STRUCTURE

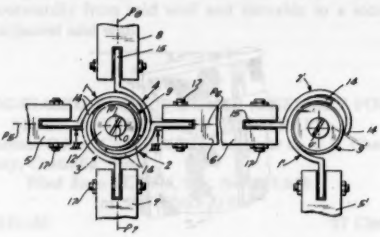
Septimius Danescu, Webgasse 43/3/6, Vienna VI, Austria (A-1060)

Filed July 26, 1976, Ser. No. 708,694
Claims priority, application Austria, Aug. 28, 1975, 6655/75
Int. Cl.² E04D *15/00*; E04H *1/00*
U.S. Cl. 52—122 **10 Claims**

1. An adjustable wall structure comprising:

a plurality of upright panels;

a plurality of resilient upright profiles respectively secured to said panels at vertical edges thereof, said profiles having resilient strip portions substantially cylindrically curved about a common vertical axis in peripherally interconvoluted relationship, thereby forming a tubular hinge interconnecting said panels with freedom of relative swinging about said axis; and



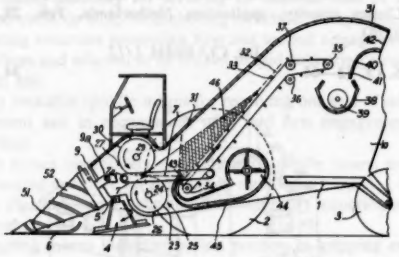
clamp means engaging said tubular hinge for relatively immobilizing said strip portions in face-to-face contact with one another.

4,070,809

AUTOMATIC SUGAR CANE HARVESTING MACHINE

Rene Soulat, Paris, France, assignor to Sodia S.A., Paris, France

Filed Aug. 15, 1975, Ser. No. 605,044
Claims priority, application France, Aug. 23, 1974, 74 28942
Int. Cl.² A01D *45/10*
U.S. Cl. 56—13.9 **32 Claims**



1. A machine for harvesting sugar cane comprising:

a machine frame,

a cutting device carried by said frame for cutting the bases of the sugar cane stems,

means carried by said frame for adjusting the working height of said cutting device relative to ground level and maintaining constant the position of said cutting device relative to said machine frame thereby adapting the machine for use over irregular ground surfaces;

means carried by said frame for slicing the cut sugar cane stems into small sections; and

means carried by said frame for sorting the various parts of the sugar cane stems and plant material and discarding specified portions of said parts,

front and rear pairs of wheels for supporting said frame;

a first compensator comprising a pair of substantially parallel arms each pivotally joined at its forward end to said frame and extending longitudinally rearwardly of said machine, said arms rotatably carrying the front pair of wheels at their respective opposite ends and forming rearwardly opening acute angles with said frame,

a second compensator including a pair of parallel arms each pivotally joined at its rearward end to said frame and extending longitudinally forwardly of the machine for resting on the ground, and

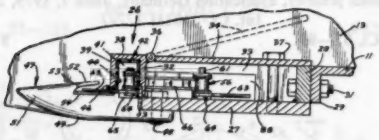
means for locking said second compensator arms at predetermined forwardly opening obtuse angles relative to said frame.

4,070,810

CUTTING APPARATUS

Henry Donald Brakke, Hickson, N. Dak. 58044

Filed Aug. 13, 1976, Ser. No. 714,040
Int. Cl.[2] A01D *55/24*
U.S. Cl. 56—291 44 Claims



1. A cutting apparatus usable with a combine header having a horizontal platform for receiving cut material comprising: an elongated base, an upright rear wall secured to the base adapted to be attached to the platform, an upright front wall secured to the base forming with the base and rear wall a chamber, a cover for closing the top of the chamber, means pivotally mounting the cover on the front wall, means releasably connecting the cover to the base allowing the cover to be moved to an open position, a housing having inside surfaces forming a passage secured to the front wall, said passage extended along said front wall, said housing having a bottom edge and an open bottom open to the passage, an inverted U-shaped insert located within the passage in engagement with the inside surfaces of the housing and the front wall, said insert having a forwardly directed lip extended under the bottom edge of said housing, a plurality of guards secured to the base, each guard having a wear plate with side cutting edges, an idler sprocket rotatably mounted adjacent one end of the base, a drive sprocket rotatably mounted adjacent the opposite end of the base, an endless chain trained about the idler sprocket and drive sprocket, a plurality of knife blades secured to the chain and extended outwardly away from the chain, each blade having a generally triangular shape with converging side cutting edges, said chain having a front run located in the passage of the insert with the blades engageable with the bottom of the lip and the top of the wear plates and a rear run located in the chamber below the cover, and means to drive the drive sprocket whereby said chain and knife blades move relative to the guards and the cutting edges of the blades move relative to the side cutting edges of the wear plates so as to cut material located between adjacent guards.

4,070,811

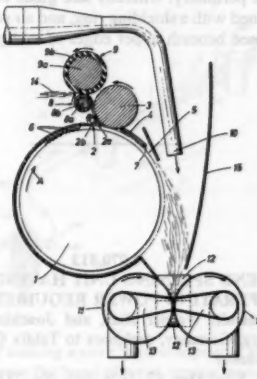
MACHINE FOR SPINNING TEXTILE FIBERS

Ernst Fehrer, Auf der Gugl 28, Linz, Austria

Continuation-in-part of Ser. No. 602,546, Aug. 7, 1975, abandoned. This application Sept. 13, 1976, Ser. No. 722,750
Claims priority, application Austria, Sept. 24, 1974, 7694/74
Int. Cl.[2] D01G *15/68*
U.S. Cl. 57—50 2 Claims

1. A machine for spinning textile fibers, which comprises the combination of

1. a carding drum rotatable at high circumferential speed in a predetermined direction, the carding drum having
   a. teeth with tips defining a cylindrical surface during rotation of the carding drum:
2. a mechanism for feeding a strand of the textile fibers to the carding drum disintegrating the strand into the textile fibers on the rotating toothed surface of the drum, the feeding mechanism comprising
   a. a pair of gripping rollers in surface contact to define a nip therebetween for feeding the strand therethrough, the rollers having axes at a fixed distance from each other whereby the surface contact is maintained, each of the gripping rollers having a hard core and an elastic surface layer wherebetween the strand is gripped, and the gripping rollers being rotatable at a circumferential speed lower than that of the carding drum,
   b. a large diameter feed roller close to the pair of gripping rollers and having a smooth surface receiving the strand from the pair of gripping rollers, the smooth surface of the large diameter feed roller being spaced from the cylindrical surface defined by the teeth of the carding drum as closely as possible, and the smooth roller surface and the cylindrical surface defining therebetween a wedge-shaped space, and
   c. a small diameter feed roller arranged in the wedge-shaped space and in contact with the smooth surface of the large diameter feed roller to define a nip therebetween for feeding the strand received on the smooth surface therethrough. the feed rollers having axes at a fixed distance from each other whereby the contact is maintained, the small diameter feed roller consisting of a hard core and an



elastic surface layer, and the small diameter feed roller preceding the large diameter feed roller in the direction of rotation of the carding drum, and being spaced from the cylindrical surface defined by the teeth, of the carding drum as closely as possible the feed rollers being rotatable at a circumferential speed intermediate that of the gripping rollers and of the carding drum;
3. a guard closely and fixedly spaced from the large diameter feed roller in the direction of rotation around part of the cylindrical surface, the guard being spaced from the cylindrical surface as closely as possible, the strand being disintegrated into the textile fibers between the toothed surface of the carding drum and the guard;
4. a spinning station arranged to receive the disintegrated textile fibers from the carding drum and for spinning the textile fibers; and
5. means for transporting the disintegrated textile fibers from the carding drum to the spinning station.

4,070,812

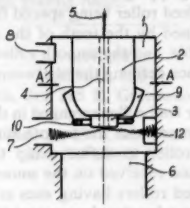
EQUIPMENT FOR PNEUMATIC MANUFACTURE OF YARN

Jerzy Ostrowski; Piotr Sierputowski, both of Warsaw; Lukasz Turkowski, Sulejowek-Ratajewo; Jerzy Jablkiewicz; Jan Pacholski, both of Lodz, and Tadeusz Jedryka, Warsaw, all of Poland, assignors to Centralny Osrodek Badawczo-Rozwojowy Naszyn Wlokienniczych, Lodz, Poland

Filed Feb. 28, 1977, Ser. No. 773,123
Claims priority, application Poland, Mar. 10, 1976, 187855
Int. Cl.[2] D01H *1/12*
U.S. Cl. 57—58.89 2 Claims

1. An apparatus for the pneumatic manufacture of yarn employing a non-rotational spinning chamber closed at one end having cylindrical insert means provided with a yarn discharge channel disposed therein, circumferential supply air

ducts for introduction of a vacuum source into the other end of the chamber, fibre delivery channel means formed of said chamber and provided upstream of an inlet of the yarn discharge channel, said apparatus including: said cylindrical insert



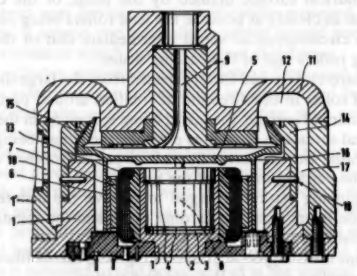
means being provided with guide means disposed about said insert lower periphery, whereby said guide means have lower edges screened with a shielding ring, and air supply duct means being disposed beneath upper edges of said guide means.

4,070,813

OPEN END SPINNING UNIT HAVING REDUCED OPERATING POWER REQUIREMENTS

Gerhard Quandt; Werner Ries, and Joachim Richter, all of Heidelberg, Germany, assignors to Teldix G.m.b.H., Heidelberg, Germany

Filed Dec. 23, 1976, Ser. No. 753,807
Claims priority, application Germany, Dec. 24, 1975, 2558758
Int. Cl.² D01H *1/12*
U.S. Cl. 57—58.89 **5 Claims**



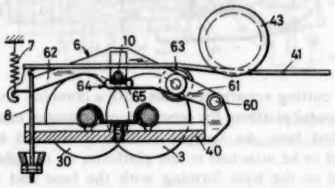
1. In an open end spinning unit having a stationary frame member presenting a yarn opening, a fiber inlet opening and a gas extraction opening, and a spinning rotor rotatably supported by the frame member and enclosed by the frame member, the stationary frame member and the spinning rotor together defining a gas flow space via which gas flows from the yarn removal opening and the fiber inlet opening to the gas extraction opening during operation of the spinning unit, and further defining an annular space coextensive with a portion of the axial extent of the rotor, the improvement comprising gas flow controlling means fixed relative to said frame member, surrounding at least a portion of said rotor and defining a narrow gap with the outer surface of said rotor which provides the only communication between said gas flow space and said annular space for substantially eliminating the flow of gas streams into said annular space.

4,070,814

APPARATUS FOR ARRESTING THE ROTOR IN AN OPEN-END SPINNING MACHINE

Georg Goldammer, Geimersheim, and Kurt Beitzinger, Ingolstadt, both of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Germany

Filed June 7, 1976, Ser. No. 693,181
Claims priority, application Germany, June 7, 1975, 2525435
Int. Cl.² D01H *1/241*
U.S. Cl. 57—89 **9 Claims**



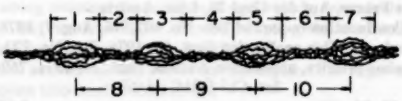
1. Apparatus for arresting the rotor of an open-end-spinning machine, the shaft of which is supported in a cradle formed by freely rotatable support rollers, and which is pressed and driven against said rollers by a tangential drive belt, comprising a pivotal lever mounted below said shaft and belt, said lever being provided with means for engaging said belt and a seat which receives said shaft, said lever being movable in the direction towards the tangential belt to sequentially lift said belt off the shaft and thereafter carry said shaft away from said support rollers.

4,070,815

TEXTURED MULTIFILAMENT YARN

Takao Negishi, and Kazuo Tomiita, both of Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Nov. 25, 1975, Ser. No. 635,230
Claims priority, application Japan, Nov. 28, 1974, 49-135886; Dec. 5, 1974, 49-138844
Int. Cl.² D02G *1/16, 3/24, 3/34*
U.S. Cl. 57—140 J **5 Claims**

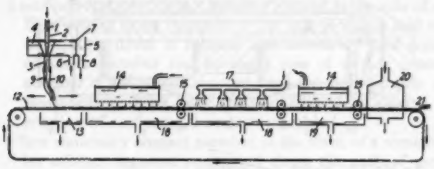


1. A multifilament yarn comprising a bundle of filaments, said yarn being composed of compact portions where the filaments are interlaced and open portions where the filaments are not substantially interlaced, said compact portions and open portions appearing alternately along the length of said yarn, each of at least 50% of said compact portions having a configuration of interlacement such that, when a compact portion is subjected to an interlacement releasing action together with the compact portions next to said compact portion, the interlacement of filaments in said compact portion cannot be released alone within said portion but it can be released together with at least a part of the interlacement of filaments in one compact portion next to said compact portion, while it cannot be released together with the interlacement of filaments in the other compact portion next to said compact portion.

4,070,816
YARN MANUFACTURING

Ralph Huggett, Rochdale, England, assignor to TBA Industrial Products Limited, Manchester, England

Continuation-in-part of Ser. No. 510,723, Sept. 30, 1974, abandoned, and Ser. No. 663,751, March 4, 1976, abandoned. This application Nov. 23, 1976, Ser. No. 744,440
Int. Cl.² D02G 3/20
U.S. Cl. 57—153 9 Claims



1. A process for making a dispersion-based asbestos strand for later twisting to form a yarn, said process comprising the steps of:

a. forming an elongate continuous stream from an aqueous coagulable dispersion comprised of asbestos fibres, water and dispersion-forming chemicals;

b. coagulating said dispersion in said stream to form a self-sustaining asbestos fibre strand containing coagulated dispersion-forming chemicals together with uncoagulated residues thereof and water;

c. whilst said strand is in an untwisted state removing substantially the whole of the coagulated dispersion-forming chemicals and said uncoagulated residues thereof, and

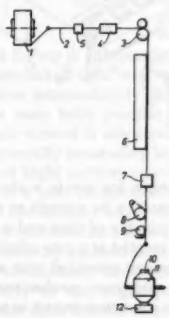
d. adjusting the water content of the strand to provide an untwisted strand formed substantially wholly of said asbestos fibres and containing not more than 20% by weight of water.

8. A never-twisted asbestos strand made by a process according to claim 1.

4,070,817
PROCESS FOR TEXTURING SYNTHETIC YARNS

Michael Bueb, Opladen; Harry Kubitzek; Arthur Langhans, both of Dormagen; Wolfgang Rellensmann, Zons, Neuss, and Wolfram Wagner, Dormagen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 2, 1976, Ser. No. 646,060
Claims priority, application Germany, Jan. 4, 1975, 2500229
Int. Cl.² D02G 1/16, 1/20
U.S. Cl. 57—157 TS 4 Claims

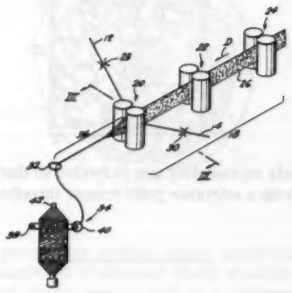


1. A process for treating synthetic yarns which have been stretched in stretching ratios of from 1:2.5 to 1:4 which comprises interlacing such yarn followed by simultaneously drawing and texturing the yarn by simultaneously drawing and texturing the yarn by false-twisting at a temperature of from 140° to 200° C.

4,070,818
METHOD OF MAKING A CORE YARN

Edmund Hamel, Romanshorn, Switzerland, assignor to Ofa AG, Horn, Switzerland

Division of Ser. No. 620,789, Oct. 8, 1975. This application Nov. 11, 1976, Ser. No. 741,119
Claims priority, application Germany, Apr. 2, 1975, 2514302
Int. Cl.² D02G 3/38
U.S. Cl. 57—160 3 Claims



1. A method of making a core yarn comprising the steps of:

forming a coherent flat band of wool, cotton, rayon or staple fiber from a fleece slubbing by flattening the same by passing the slubbing through a plurality of pairs of rollers,

feeding said coherent elongated flat band of slubbing to a combining station,

simultaneously feeding a pair of synthetic-resin core filaments in spaced-apart relationship to said station,

pressing said filaments against opposite flanks of said slubbing at said station between a pair of rollers with a portion of said slubbing between said filaments, and

thereafter spinning the filaments and slubbing together about a common axis while maintaining the thickness of said band between the filaments, said band having a width relative to the diameters of said core filaments such that portions of the band overlap around said filaments and have intertwined fibers at the overlapping portion upon spinning.

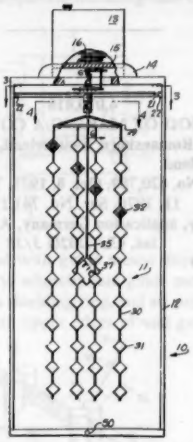
4,070,819
VERTICAL CLOCK

Alcuin Kelly, 60 N. Catherine St., Mobile, Ala. 36604

Filed Aug. 25, 1976, Ser. No. 717,614
Int. Cl.² G04B 45/00
U.S. Cl. 58—2 4 Claims

1. A vertical clock comprising an elongated case, clock works positioned on top of the case having an hour shaft eminating centrally downward therefrom, a linkage attached to the hour shaft of the clock works, a square plate connected to the linkage and rotated according to the rotation of the hour shaft, and twelve strings hanging from the periphery of the square plate such that radial lines extending from points where the strings hang from the periphery of the square plate to the

center of the square plate define equal included angles and each string is provided on its depending portion with cubes



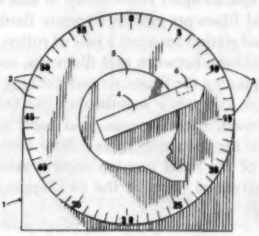
consecutively representing one to twelve so that time may be observed from a referance point remote therefrom.

4,070,820

DOUBLE KITCHEN TIMER

Orest Lewinter, and Barbara Lewinter, both of 104 Homestead Ave., Albany, N.Y. 12203

Filed Aug. 19, 1976, Ser. No. 715,896
Int. Cl.[2] G04F 3/02
U.S. Cl. 58—21.13 2 Claims



1. A spring-driven timer with the capability of selection of either one or two time intervals, which consists of:

a. a case, upon which are placed numerals and indicia signifying intervals of time

b. a primary and a secondary knob on a common center which are rotated in conjunction manually by means of a tab, which is part of the primary knob

c. a solid shaft which extends from the primary knob to a hammer mechanism

d. a hollow shaft concentric to the solid shaft which extends from the secondary knob to a second hammer mechanism

e. two hammers which are cocked by their respective hammer mechanisms

f. a common clock mechanism which rotates both the primary and secondary knobs

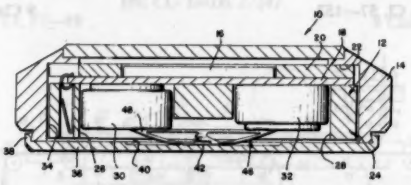
g. a common bell which can be struck by either both hammers concurrently or by each hammer consecutively.

4,070,821

ELECTRIC WATCH BATTERY CONTACT SPRING

Bela Somogyi, Costa Mesa, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Mar. 22, 1976, Ser. No. 669,131
Int. Cl.[2] G04C 3/00; H01M 6/50
U.S. Cl. 58—23 BA 11 Claims



1. An electric watch comprising:

a case having an open rear, said case having a central axis extending out of said open rear;

an electric watch module in said open rear of said case, said electric watch module comprising at least first and second batteries exposed to the rear of said module, said batteries being arranged substantially equidistant from said axis;

a case back engaged on said case and covering said open rear of said case;

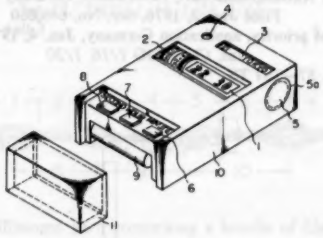
a single spring engaging said case back and the exposed rear of both of said batteries to electrically connect said batteries and to thrust them in a direction into said case, said spring being substantially circular and having its center positioned substantially on said axis, said spring being concave and having an uninterrupted peripheral rim and a central hub, said rim engaging both of said batteries and said hub engaging said watch back.

4,070,822

TIMER MECHANISM FOR USE IN A CLOCK

Kiyoyuki Arai, Tokyo, Japan, assignor to Copal Company Limited, Tokyo, Japan

Filed Sept. 20, 1976, Ser. No. 724,525
Claims priority, application Japan, Sept. 22, 1975, 50-114442; Dec. 18, 1975, 50-151407
Int. Cl.[2] G04B 23/00; G04C 21/16; H01H 7/08
U.S. Cl. 58—38 R 8 Claims



1. In a timer mechanism for use in a clock having a first rotatable member adapted to be rotated at a rate relating to advance of individual minutes of time and a second rotatable member adapted to be rotated at a rate relating to advance of individual hours of time and provided with an electric source and an electric device, said timer mechanism having a switch adapted to be closed at a set time preset in said timer mechanism to connect said electric source to said electric device so as to operate the latter at said preset time, said switch comprising:

a minute setting drum having a pair of diametrically oppositely oriented through-holes therein and adapted to be manually rotated to a selected position and held thereat so as to set said set time in terms of minute;

a first rotatable contact member driven by said first rotatable member and having a pair of switch contacts adapted to be passed through said through-holes in said minute setting drum when aligned therewith during the rotation of said first contact member;

an hour setting drum arranged coaxially with said minute setting drum at the side thereof opposite to that at which said first contact member is located and having a pair of diametrically oppositely oriented through-holes therein and adapted to be manually rotated to a selected position and held thereat so as to set said set time in terms of hours;

a second rotatable contact member located at the side of said hour setting drum opposite to the side at which said minute setting drum is located and driven by said second rotatable member and having a pair of switch contacts adapted to be passed through said through-holes in said hour setting drum when aligned therewith during the rotation of said second contact member;

a first stationary contact member in the form of a semicircular contact segment positioned along the path of movement of said switch contacts of said first rotatable contact member;

a second stationary contact member in the form of a semicircular contact segment positioned along the path of movement of said switch contacts of said second rotatable contact member; and

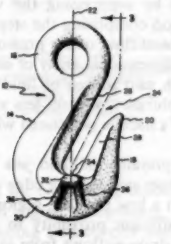
a third stationary contact member having a pair of semicircular contact segments each positioned along the path of movement of said switch contacts of said first or said second rotatable contact member complementary with respect to said first or said second stationary contact member.

4,070,823

CHAIN HOOK

Kenneth D. Schreyer, Clarence, and Soma M. Rohosy, Hartland, both of N.Y., assignors to Columbus McKinnon Corporation, Tonawanda, N.Y.

Filed July 6, 1976, Ser. No. 702,614
Int. Cl.² F16G *17/00*
U.S. Cl. 59—93 **7 Claims**



1. A chain hook for use in combination with a chain comprising a series of interlinked bent wire type chain links having straight leg portions intermediately of their end portions, said hook including a main body portion of generally U-shaped configuration when viewed in side elevation, comprising a pair of spaced apart generally upstanding legs joined at their lower ends by an integral bight portion, one of said legs terminating at its upper end in a load connection device, said legs being generally parallel but inclined when viewed in said side elevation and defining therebetween a forwardly inclined throat for receiving in downwardly inclined sliding manner a link of said chain to rest in substantially horizontally sidewise reclining attitude transversely of said bight portion, said legs being bevelled at opposite sides thereof to complement the configurations of the ends of the links engaging said horizontally disposed link, said bight portion including a pair of lugs extending transversely outwardly of said bight portion in opposite directions from said hook body and providing therewith a straight horizontal saddle extending across the lugs for supporting said horizontally disposed link, whereby said saddle provides support to said horizontally disposed link regardless of the length of the link without creating localized stresses which would cause said link to fail prematurely.

4,070,824

INTEGRATED FLOW TURBINE ENGINE

Earl W. Traut, 5059 NE. 15th Ave., Fort Lauderdale, Fla. 33308

Division of Ser. No. 40,633, May 26, 1970, Pat. No. 3,709,629, and a continuation of Ser. No. 299,135, Oct. 19, 1972, abandoned, and a continuation-in-part of Ser. No. 741,623, July 1, 1968, abandoned. This application Mar. 12, 1975, Ser. No. 557,898
Int. Cl.² F02C *3/04*
U.S. Cl. 60—39.43 **11 Claims**

1. An integrated flow turbine engine comprising a rotor which has a single set of identical blades attached to it, said rotor with said blades serving both as a compressor and a turbine, at least one combustion chamber in which fuel is combusted, said rotor, upon being caused to rotate, serving to deliver air to said combustion chamber to mix with fuel therein, a plurality of substantially arcuately shaped wall components defining a boundary between said rotor and said combustion chamber, said wall components being spaced somewhat apart to accomodate the flow of gases between said combustion chamber and said rotor, at least one exhaust nozzle extending from said combustion chamber and directed toward a portion of said rotor, said exhaust nozzle being configured to direct the hot gases flowing from said combustion chamber onto an essentially different portion of the blades of the rotor than the portions concerned with the compression of incoming air, thus to drive said rotor in rotation, said rotor being in essentially surrounding relationship about said combustion chamber, and the air compressed by said rotor flowing essentially centripetally in flowing into said combustion chamber.

4,070,825

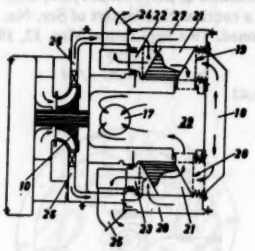
GAS TURBINE POWER PLANT

Sven-Olof Kronogård, Lomma, Sweden, assignor to United Turbine AB & Co., Sweden

Continuation of Ser. No. 527,308, Nov. 26, 1974, abandoned. This application Oct. 14, 1976, Ser. No. 732,420
Int. Cl.² F02C *7/10*
U.S. Cl. 60—39.51 R **9 Claims**

1. A gas turbine power plant including: (a) a compressor part having a rotational axis; (b) a turbine part operating on the same rotational axis as the compressor part, but being axially-spaced therefrom and means forming a radial passageway for combustion gases between said compressor part and said turbine part, said turbine part being designed for axial flow and having an inward end adjacent to said radial passageway and an outward end remote therefrom; (c) at least one combustion chamber for supplying combustion gases to said turbine part; (d) airpreheating means for preheating combustion air between said compressor part and said at least one combustion chamber by means of combustion gases leaving said turbine part; (e) a

common housing enclosing said compressor part, said turbine part and said air-preheating means; and (f) a power take-off from the power plant located at the compressor part end of the housing, said air-preheating means including at least two box-shaped units, located to opposite sides of said turbine part extending about from its inward end to its outward end and presenting an inward face towards said turbine part, and turning an outward face away therefrom, each of said units comprising at least two, heat exchange elements, arranged for



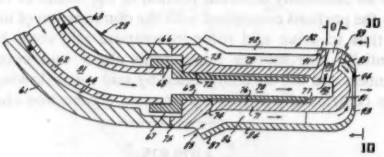
parallel flow, distribution and collecting means at the axial ends of said elements as well as at the inward and outward faces thereof, said distribution and collecting means being defined by transverse end walls and inward axial walls, said walls being provided with fluid conductive sockets to individually and removably receive said elements, and each of said elements having a hollow stud and socket connector part at one axial end and an expandible bellows connector part at its opposite axial end, and further a stud and socket connector part at its inward face.

4,070,826

LOW PRESSURE FUEL INJECTION SYSTEM

Richard E. Stenger; Edward E. Ekstedt, both of Cincinnati; John M. Richey, Fairfield, and Stanford P. Seto, Loveland, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Dec. 24, 1975, Ser. No. 644,040
Int. Cl.² F02C 7/22; B05B 7/32
U.S. Cl. 60—39.66 **14 Claims**



1. An improved fuel injector of the type attached to a fuel supply for receiving fuel and discharging it into an airstream for carburetion thereof, wherein the improvement comprises:

a. a hollow body attachable at its one end to a fuel supply line and having at its other end a flow tube extending from said body, said flow tube having a hole formed therein for discharging fuel from said body; and

b. a shroud formed around the outer side of said body to form a cavity between said shroud and said body, said shroud comprising a cylindrical portion and a flared portion extending radially outwardly from said cylindrical portion to define an air inlet to said cavity for receiving an uncarbureted air supply, and said cavity having an axial air outlet at its downstream end for discharging a portion of the uncarbureted air in a substantially axial direction and an outlet aperture through which said flow tube extends and through which air is discharged in surrounding relationship with said flow tube.

12. An improved fuel injector of the type attached to a fuel supply for receiving fuel and discharging it into an airstream for carburetion thereof, wherein the improvement comprises:

a. a hollow body attachable at its one end to a fuel supply line and having at its other end a fuel discharge port;

b. a shroud formed around the outer side of said body to form a cavity between said body and said shroud for the conduct of relatively hot air to be used for carburetion;

c. a sleeve disposed concentrically within said body to define an annulus between said sleeve and said body; and

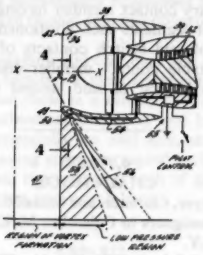
d. a gap associated with said sleeve to fluidly connect said annulus with said fuel supply line to allow the entry of fuel into said annulus for the purpose of decomposing carbon deposits which may form therein.

4,070,827

METHOD AND APPARATUS FOR LIMITING INGESTION OF DEBRIS INTO THE INLET OF A GAS TURBINE ENGINE

Charles R. Vanfleet, and William C. Ruehr, both of Cincinnati, Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed May 3, 1976, Ser. No. 682,195
Int. Cl.² F02C 7/04
U.S. Cl. 60—204 **12 Claims**



1. A method of limiting ingestion of ground debris into a gas turbine engine inlet by suppressing the vortex causing said ingestion, said method comprising the steps of:

providing a source of fluid under pressure;

providing a two dimensional array of nozzles in fluid communication with said source of fluid under pressure for introducing a plurality of fluid jets at a point aft of the leading edge of a nacelle associated with said engine inlet; and

discharging said plurality of fluid jets from said array of nozzles away from said leading edge and in the aft direction to establish a low pressure region aft of said leading edge and in sufficient proximity to a vortex formation region so as to draw airflows from said vortex formation region into said low pressure region and away from said engine inlet.

4,070,828

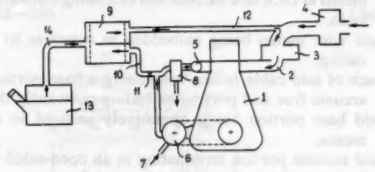
DEVICE AND METHOD FOR RECYCLING HYDROCARBON VAPORS OF I.C.E. VEHICLES

Roland Barres, Boulogne-Billancourt, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt and Automobiles Peugeot, Paris, both of, France

Filed Jan. 14, 1976, Ser. No. 649,081
Claims priority, application France, Jan. 15, 1975, 75 01130
Int. Cl.² F01N 3/10
U.S. Cl. 60—274 **3 Claims**

1. A method for use with an engine having a carburetor, an air filter, a pipe connecting the carburetor and air filter, an exhaust system, a fuel tank and employing an anti-pollution pump for injecting fresh air into the exhaust system of the engine, the method for supplying to the carburetor the hydrocarbon vapours emitted by the engine comprising the steps of,

providing a hydrocarbon adsorption canister between the fuel tank and the pipe connecting the air filter and the carburetor, wherein the hydrocarbons are adsorbed by the material contained in said canister, supplying an air stream under pressure



produced by said pump to said canister, whereby the hydrocarbon vapours are desorbed by means of the air stream, and supplying the desorbed hydrocarbon vapours in the air stream to the carburetor.

4,070,829

APPARATUS FOR CONTROLLING SECONDARY AIR FOR CLEANING EXHAUST GASES

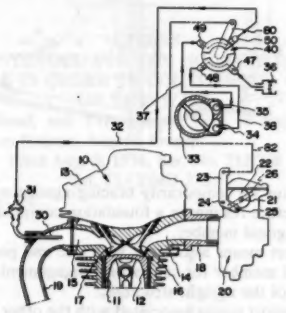
Toshimitsu Yoshimura, Shiki, and Minoru Matsuda, Chofu, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 12, 1976, Ser. No. 713,826

Claims priority, application Japan, Aug. 13, 1975, 50-98420; Aug. 14, 1975, 50-99009

Int. Cl.² F01N *3/10*; F02B *75/10*

U.S. Cl. 60—290 **11 Claims**



1. An apparatus for controlling secondary air for cleaning exhaust gases of an engine, comprising:

said engine including a carburetor and a throttle valve;

an air pump operably connected to and driven by said engine;

a secondary air control valve provided with a valve body;

a rotor member (60) rotatably carried in said body and partitioning said body into first and second main chambers;

said control valve including a first path for feeding air to said first chamber;

said control valve including a second path for feeding air to the suction side of said air pump driven by said engine from said first chamber;

said control valve including a third path making said second chamber and the delivery side of said air pump communicate with each other;

said control valve including a fourth path making said second chamber and the exhaust path of said engine communicate with each other; and

said control valve including a fifth path making said first and second chambers communicate with each other at a predetermined angle of rotation of said rotor member, said rotor member of said valve being a rotating operating cam formed to be rotated and operated by the operation of said throttle valve of said carburetor of said engine.

4,070,830

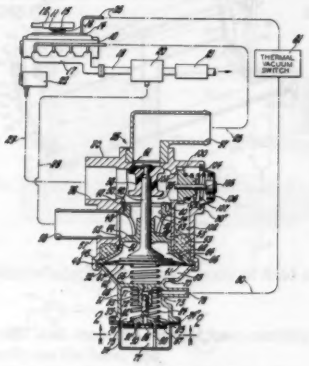
INTEGRAL AIR SWITCHING DIVERTER VALVE

David W. Beiswenger, Brockport, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 22, 1976, Ser. No. 735,047

Int. Cl.² F02B *75/10*

U.S. Cl. 60—290 **5 Claims**



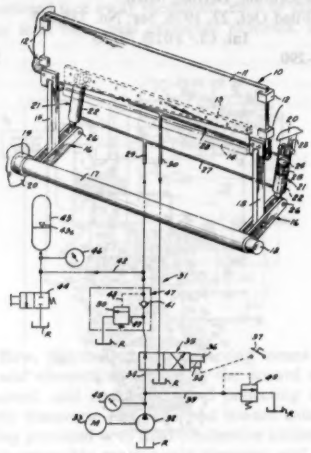
1. An integral air switching diverter valve for use with an engine having an induction system with a throttle movable therein and an exhaust emission control system including an exhaust manifold connected to the engine and an exhaust conduit for receiving exhaust gases discharged from the exhaust ports of the engine and defining a flow path for passing the exhaust gases through a converter and, a driven air pump for providing secondary air, said integral air switching diverter valve including a housing means having passage means defining an inlet flow path for receiving said secondary air, a primary discharge flow path for delivery of air to said exhaust manifold and a secondary discharge flow path for delivery of air to said converter, one end of each of said inlet flow paths, said primary discharge flow path and said secondary discharge flow path opening into a valve chamber in said housing means with said one end of said primary discharge flow path being axially aligned in spaced apart relation to said one end of said secondary discharge flow path, a valve means including a valve head positioned in said valve chamber for movement between a first position blocking said one end of said primary discharge flow path and a second position blocking said one end of said secondary discharge flow path, said valve means further including actuator means operatively connected to said valve head, said actuator means including a diaphragm forming with a first portion of said housing means a pressure chamber open to the atmosphere on one side of said diaphragm and on its other side a non-atmospheric pressure actuator chamber, a bleed orifice means in said housing means in communication at one end with said actuator chamber and at its other end in communication with the atmosphere, a passage means having one end in communication with said actuator chamber and connectable at its other end to a source of non-atmospheric pressure fluid, and a second valve means operatively positioned in said housing means for movement to control flow through said passage means, said second valve means including a second actuator means having a diaphragm with a timing valve means therein forming with a second portion of said housing means a vacuum chamber on one side of said diaphragm connected to the induction system downstream of the throttle and a timing chamber on the opposite side of said diaphragm, said timing chamber being in fluid communication with said vacuum chamber as controlled by said timing valve means.

4,070,831

HYDRAULIC DRIVE CIRCUIT FOR MACHINE TOOLS

Leon E. Rutz, Lake City, Minn., assignor to Houdaille Industries, Inc., Buffalo, N.Y.

Filed Jan. 7, 1977, Ser. No. 757,654
Int. Cl.[2] F15B *1/02, 15/18*
U.S. Cl. 60—371 15 Claims



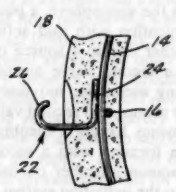
1. A fluid drive for double acting piston and cylinder power rams which comprises conduits supplying and draining fluid from opposite ends of the ram cylinder on opposite sides of the piston therein to alternately drive the piston to opposite ends of the cylinder, a pump supplying fluid to said conduits, a reservoir receiving fluid from said conduits, a reversing valve controlling the direction of flow of fluid through the conduits, an accumulator communicating with one of the conduits to maintain a predetermined fluid pressure therein, a sequence unloading valve in said one conduit unloading the pump whenever fluid pressure in the conduit is above a predetermined maximum controlled by said accumulator, a relief valve set to open at a higher pressure than said sequence unloading valve communicating with the pump discharge, a dump valve for said accumulator, and means biasing said reversing valve to flow fluid through the conduits for holding the piston in the power ram at one end of its stroke until the reversing valve is actuated against the bias to flow fluid for driving the piston to the other end of its stroke to deliver power.

4,070,832

CONCRETE WELL CASING WITH CABLE HOOKS EMBEDDED THEREIN

Gottlieb W. Grosch, Silver Creek, Nebr. 68663

Filed Oct. 26, 1976, Ser. No. 730,391
Int. Cl.[2] E04D *15/00*
U.S. Cl. 52—125 3 Claims



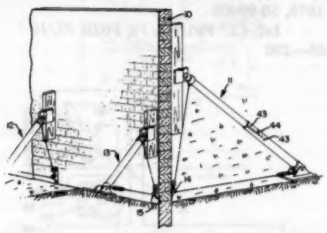
1. A concrete well casing, comprising,
a cylindrical reinforcing wire means having inner and outer sides and upper and lower ends, said reinforcing wire means being comprised of a plurality of substantially horizontally disposed and vertically spaced-apart ring-shaped members operatively interconnected,
at least one cable hook operatively secured to said wire means at each side thereof and extending outwardly therefrom,
said wire means being embedded in concrete to form the casing,
each of said cable hooks comprising a base portion and an arcuate free end portion extending outwardly therefrom,
said base portion being operatively secured to said wire means,
said arcuate portion terminating in an open-sided C-shaped hook portion defining a cable receiving area,
said C-shaped hook portion being initially substantially flush with the exterior surface of said casing but which may be deflected outwardly therefrom for receiving a casing positioning cable in said cable receiving area for attachment thereto.

4,070,833

BRACING APPARATUS

Loren Hancock, P.O. Box 887, Cheyenne, Wyo. 82001

Filed Apr. 19, 1976, Ser. No. 678,049
Int. Cl.[2] E04H *12/20*
U.S. Cl. 52—148 11 Claims



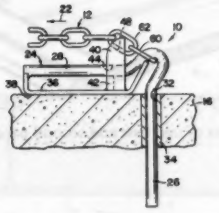
1. Apparatus for temporarily bracing against windloads an upright structure resting on a foundation comprising
a rigid diagonal member,
first support means associated with one end portion of the diagonal member for supporting engagement with a side surface of the upright structure,
second support means associated with the other end portion of the rigid diagonal member for supporting engagement with a support surface adjacent the side of the upright member,
anchoring means secured to the structure at a point above the foundation,
guide means associated with the anchoring means for engaging and guiding a flexible stay member under tension,
an elongated, continuous flexible stay member passing longitudinally around and in guided relation to the guide means,
first connection means connecting one end of the flexible stay member to the one end portion of the rigid diagonal member,
second connection means connecting the other end of the flexible stay member to the other end portion of the rigid diagonal member,
tensioning means acting on the flexible stay member between the first and second connection means for drawing the flexible stay member tight around the anchor guide means between the first connection means and the second connection means to thereby exert controlled forces on each of the end portions of the diagonal member acting in the direction of the guide means, whereby the rigid diagonal member exerts compressive forces on the upright structure and the support surface.

4,070,834

FLOOR-PRESSURE HOLD ANCHOR

Robert W. Jameson, 1690 Nutwood Road, Akron, Ohio 44305

Filed June 7, 1977, Ser. No. 804,235
Int. Cl.[2] E02D 5/74
U.S. Cl. 52—166 5 Claims



1. In combination,

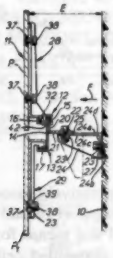
a chain and a hold down anchor for the chain and comprising a substantially L-shaped metal bar one arm of which is adapted to be positioned in a hole in a floor, a support block secured to the second arm of said metal bar and extending upwardly therefrom, the upper end of said support block being bifurcated and having a surface inclined upwardly and away from said metal bar first arm, said chain having one link engaging said metal bar and having a link bearing on said support block surface for load transmittal to said metal bar and support block, the other end of said chain extending to another area for attachment to a load.

4,070,835

DEVICE INTENDED FOR THE HOOKING OF PANELS ON A WALL IN ORDER TO CONSTITUTE A COVERING ON THIS WALL

Roger Revérend, and Yves Cochin, both of Angers, France, assignors to Safama, Angers, France

Filed Aug. 9, 1976, Ser. No. 712,765
Int. Cl.[2] E04B 2/88
U.S. Cl. 52—235 7 Claims



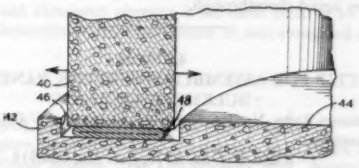
1. A mounting assembly for fixing a wall covering comprised of a plurality of panels on a wall, said mounting assembly comprising for each said panel plural support members in aligned spaced relation having means for attachment on the wall, an upper and a lower set of panel bearing elements having means for securement to each said panel, an elongate one-piece structural element including a main web, a first longitudinal groove disposed on one side of said main web and hooked onto said support members in longitudinally adjustable relation with respect thereto, a pair of upper and lower second longitudinal grooves disposed on the opposite side of said main web, each said second groove longitudinally adjustably receiving one of said sets of panel bearing elements, said upper second longitudinal groove receiving said lower set of panel bearing elements of an upper panel and said lower second longitudinal groove receiving said upper set of panel bearing elements of a next lower panel.

4,070,836

BEARING MEMBER

Arthur M. James, Beaverton, and Edgar Terry Dalton, Lake Oswego, both of Oreg., assignors to Arthur M. James, Beaverton, Oreg.

Filed Aug. 11, 1976, Ser. No. 713,415
Int. Cl.[2] E04B 1/36; F16C 17/02
U.S. Cl. 52—245 8 Claims



1. An installation adapted to carry a body of fluid comprising

a base,

an endless side wall mounted on said base exerting a force downwardly on the base, and

a substantially endless bearing member intermediate the side wall and base providing a seal inhibiting leakage of the fluid, said bearing member extending in a course substantially paralleling said endless side wall,

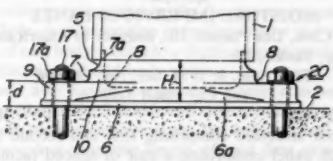
said bearing member comprising a collapsed and flattened tube of flexible elastomeric material, said tube in a relaxed and unstressed state being hollow and having flexible coating of lubricant material of substantially uniform thickness coated on the inner surface of the tube, said coating of lubricant material with said tube in a relaxed and unstressed state enveloping a hollow space within the tube, said hollow space within the tube being vented to the atmosphere and such venting permitting the tube under load to have a collapsed and flattened condition, the coating of lubricant material promoting relative sliding movement of opposed wall portions in the flattened tube tending to be induced by relative movement of said side wall relative to the base.

4,070,837

HOLLOW STEEL COLUMN BASE MEMBER AND WELDING THEREOF

Kuniaki Sato, Hiratsuka, Japan, assignor to Kajima Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 385,166, Aug. 2, 1973, Pat. No. 4,048,776. This application Sept. 15, 1975, Ser. No. 613,547
Claims priority, application Japan, Aug. 21, 1972, 47-82799; Aug. 21, 1972, 47-82800
Int. Cl.[2] E02D 27/00
U.S. Cl. 52—297 6 Claims



1. A steel column base plate member for connecting a hollow steel column member to a concrete foundation, which base plate member is a unitary body comprising a substantially planar bottom plate portion engageable with said concrete

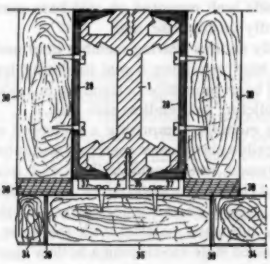
foundation, a projection upwardly extending from the planar bottom plate portion and having a top surface whose shape is substantially identical to but somewhat wider inwardly than cross sectional shape of the steel column member, J-shaped welding grooves formed along overall outer edges of said top surface of said projection facing to a lower end of said column member extending from outer peripheries of the top surface of said projection so as to effect J-shaped groove welding between said lower end of the column member and the J-shaped welding grooves, a sloped top surface formed between said projection and said bottom plate portion so as to increase the thickness thereof as the planar bottom plate portion extends toward said projection, and abutments formed on the planar bottom portion in a sufficient thickness and having anchor bolt holes bored therethrough.

4,070,838

CLIP FOR ASSEMBLING SCREENS, PANELS OR BULKHEAD SECTIONS

Johannes Kuhn, Verden, Germany, assignor to V.G.S. G.m.b.H., Germany

Filed Oct. 22, 1975, Ser. No. 624,918
Claims priority, application France, Oct. 23, 1974, 74 40152; Oct. 23, 1974, 74 40153; Nov. 15, 1974, 74 40661
Int. Cl.[2] E04B *2/72*
U.S. Cl. 52—400 **12 Claims**



1. A clip comprising: a body having an elongated cross section symmetrical about a longitudinal axis of symmetry and a lateral axis of symmetry; said body having a pair of axial slots at opposite ends of the cross section and extending inwardly of the body along the longitudinal axis of symmetry; said body having two pairs of grooves each disposed symmetrically about a respective one of the axial slots and extending into the body generally along a longitudinal dimension of the body cross section and opening adjacent the respective one of the axial slots on opposite sides thereof, each of said grooves having facing inner side walls defining means for retaining; and said body having a pair of opposed lateral channels disposed symmetrically on opposite sides of the longitudinal axis of symmetry and having a width extending longitudinally of said body cross section symmetrically about the lateral axis of symmetry, each of the lateral channels having a pair of walls having facing surfaces defining means for retaining.

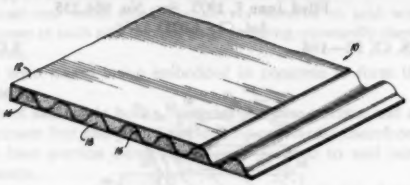
4,070,839

MOISTURE IMPERVIOUS PANEL

Arthur G. Clem, Des Plaines, Ill., assignor to American Colloid Company, Skokie, Ill.

Filed Sept. 9, 1976, Ser. No. 722,004
Int. Cl.[2] E04B *5/52*
U.S. Cl. 52—448 **8 Claims**

1. A deck structure comprising first and second adjacent panels each panel comprising a pair of spaced facing sheets interconnected by a central rigid, non-biodegradable, corrugated support sheet forming a plurality of voids between the central rigid sheet and respective ones of the facing sheets, and a mixture of water-swellable bentonite and a compressible filler substantially filling said voids; and a wear surface covering the top faces of said first and second panels, said top faces being water penetrable; said central, rigid, non-biodegradable, corrugated support sheets of said first and second panels overlapping in mating contact.

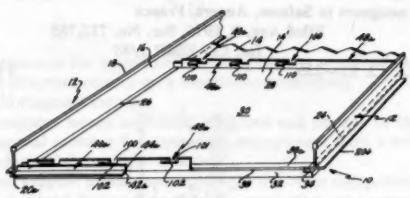


4,070,840

SUSPENDED CEILING CONSTRUCTION

Henry E. Moomey, Jr., Grand Rapids, Mich., assignor to James C. Shuster, Grand Rapids and William G. Brinks, Grandville, both of, Mich., part interest to each

Continuation-in-part of Ser. No. 546,309, Feb. 3, 1975, Pat. No. 3,988,871, which is a continuation-in-part of Ser. No. 407,802, Oct. 9, 1973, Pat. No. 3,863,413. This application Nov. 1, 1976, Ser. No. 737,782
Int. Cl.[2] E04B *5/52*
U.S. Cl. 52—489 **15 Claims**



1. Components for a suspended ceiling construction comprising:

a ceiling tile;

a first spline means operatively associated with said ceiling tile for facilitating support of said ceiling tile;

a generally horizontal slot means for facilitating support of components of the suspended ceiling construction and a vertical access in communication with said slot means, said horizontal slot means being included in at least one of said ceiling tile and said first spline means;

a second spline means operatively associated with said ceiling tile and said first spline means for facilitating support of said ceiling tile, said second spline means having a support means adapted to be receivable within said slot means; and

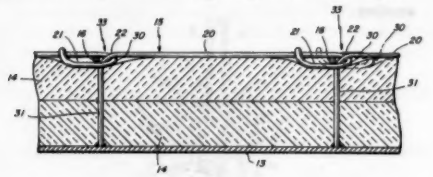
said first and second spline means being relatively movable with respect to each other between a support position and a release position; wherein in said support position said support means is positioned within said slot means thereby securing said ceiling tile to the suspended ceiling and wherein in said release position said support means is aligned within said vertical access thereby releasing said ceiling tile from the suspended ceiling.

4,070,841

INSULATED WALL MEANS AND METHOD

Paul G. La Haye, and Ralph E. Anderson, both of Cape Elizabeth, Maine, assignors to Hague International, S. Portland, Maine

Filed May 4, 1976, Ser. No. 683,062
Int. Cl.[2] F27D 1/16; E04B 1/62
U.S. Cl. 52—506 6 Claims



1. An insulated material comprising a first wall having a surface with a layer of insulation thereover,

said insulation being anchored to said wall by a plurality of rods each attached to said wall and extending through said insulation,

said insulation being in sheet form and having a thermal conductivity in the range of from 0.01 BTU/hr/ft^2/° F/ft to 0.2 BTU/hr/ft^2/° F/ft.,

said rods extend upwardly from said metal surface and being bent over to define a portion substantially coextensive with said wall sandwiching therebetween an insulating layer,

a free end of each rod looped about and under a bent over portion of another rod so as to provide a sliding joint allowing expansion and contraction of each rod with respect to the joint while still maintaining said joint and binding said insulation to said plate,

said rods are arranged in rows and adjacent rods are stitched to each other at said sliding joints, to form transverse rows,

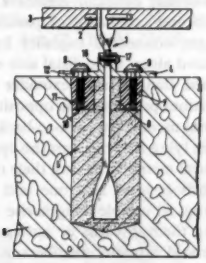
and transverse wire means interlocking with said sliding joints and mounted in slipping relationship therewith.

4,070,842

METHOD AND ARRANGEMENT FOR ORIENTING OBJECTS ON SUPPORT STRUCTURES

Artur Fischer, Weinhalde 34, D-7244 Tumlingen, Waldachtal 3, Germany

Filed Sept. 15, 1976, Ser. No. 723,646
Claims priority, application Germany, Sept. 26, 1975, 2542971
Int. Cl.[2] E04B 2/30
U.S. Cl. 52—508 13 Claims



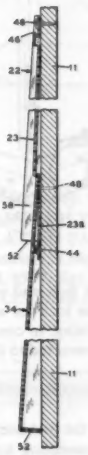
1. Arrangement for anchoring objects at a distance relative to a support formed with an anchoring hole, comprising an elongated element having a leading anchoring portion insertable with clearance into the hole for anchoring therein, and a trailing carrying portion outside the hole for supporting an object at a distance from the support; a fixing member fixedly mountable in the hole and having a surface which faces outwardly of the hole, said fixing member including an elongated passage through which said elongated element also passes with clearance; a plate member overlying said surface of said fixing member and being connected to said trailing portion of said elongated element; and adjusting means for moving said elongated element relative to both said passage and the anchoring hole between any of a plurality of positions relative to said fixing member, including a slot in said plate member and extending generally transversely of the direction of insertion of said elongated element into the hole, and locking means in said slot for arresting said plate member against movement relative to said fixing member to thereby secure said elongated element in a selected one of said positions, whereby the object supported on said elongated element is movable relative to the support in dependence upon movement of said elongated element.

4,070,843

SIMULATED SHINGLE ARRANGEMENT

Robert Leggiere, 34 Whitlaw Lane, Chappaqua, N.Y. 10514, and Michael Frank Saggese, 2140 Old Hickory Blvd., Nashville, Tenn. 37215

Filed Dec. 16, 1976, Ser. No. 751,416
Int. Cl.[2] E04D 3/362
U.S. Cl. 52—521 6 Claims



1. In a simulated shingle arrangement comprising

a generally rectangular shell having a body section equipped along the opposite side edges thereof with inwardly extending first and second sidewalls and along the bottom edge thereof with an inwardly extending end wall section, said sidewalls being tapered from greater dimensions adjacent the bottom of said shingle to reduced dimensions adjacent the top thereof to provide the shingle with a wedge-shaped configuration, and equipped with mounting areas spaced along the upper edge thereof, each of said mounting areas consisting of a flat depression including a nail hole, said depression extending below the under surface of said body section to a depth approximately equal to the thickness of said body section

said shell also having cooperable means attached to the lower edge of the first sidewall and extending from the top of said body section toward the bottom thereof for a distance less than the length of said first sidewall and interlockingly engagable with similar shingles adjacent thereto in side-by-side relation and permitting lateral adjustment therebetween

and tab locking means comprising a first web attached to the lower edge of the second sidewall beginning at a distance

from the top of said second sidewall approximately equal to the length of said cooperable means and extending a part of the way toward the bottom of said second sidewall, and a tab attached to the bottom edge of said first web and extending downwardly to a point between said end wall section, said tab being unattached to said second sidewall to enable the top edge of one shingle to overlap the tab of a second shingle adjacent thereto and to lie beneath the bottom portion of said second shingle in interlocking top-to-bottom relation therewith,

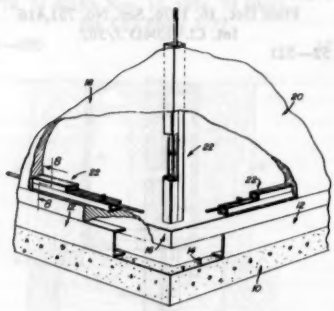
the improvement which comprises locating said tab in a plane parallel to the plane of said first web, and below the plane of said first web at a distance equal to or slightly greater than the thickness of said body section, whereby a rainproof joint is provided.

4,070,844

SPRING LOADED CAM LOCK

Karl H. Elze, Rte. 3, Box 255, Minden, Nev. 89423

Filed Aug. 16, 1976, Ser. No. 714,839
Int. Cl.² E04C *1/10*
U.S. Cl. 52—584 **1 Claim**



1. In combination with first and second structural components, a spring loaded cam lock for attaching the components together, the lock comprising, in combination:

a. first keeper means connected to the first structural component;

b. second keeper means connected to the second structural component; and

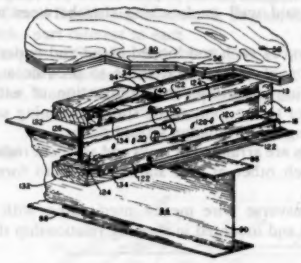
c. bolt means engaging the first keeper means and the second keeper means for connecting together the keeper means and the first structural component and second structural component, each of the keeper means including a spring lock provided with a substantially circular opening, and the bolt means including a torsion bar inserted in the opening of each of the keeper means for camming the inner locks relative to one another, the torsion bar being longitudinally extending and having a non-circular cross section forming a longest dimension, with the torsion bar being restrained against longitudinal movement by a 90° rotation of the bar from a position with the longest dimension of the cross section of the bar disposed transverse of the longitudinal extent of the spring locks to a position with the longest dimension parallel to the longitudinal extent of the spring locks, which cams the openings of the spring locks of the first keeper means and the second keeper means into substantial alignment with one another, the keeper means each including a channel including a web and a pair of spaced, codirectionally depending legs, and a spring lock mounted on the web and extending codirectionally with the legs, and offset extensions provided on the legs of only one of the channels and arranged for permitting the channels to interengage with one another, the spring lock being provided with an opening arranged for receiving the bolt means, the channel of each of the keeper means being mounted on a respective one of the first structural component and the second structural component, each of the keeper means including a plurality of generally planar spring locks provided with openings substantially coaxially to one another, with the planes of each of the spring locks being substantially parallel to one another with each of the keeper means including a plurality of the spring locks spaced along the associated channel and provided with openings substantially coaxial to one another.

4,070,845

MULTI-PURPOSE CONCRETE FORMWORK STRUCTURAL MEMBER WITH NOVEL FACILITIES FOR EXTENDING THE EFFECTIVE LENGTH THEREOF

David L. Cody, Hoffman Estates, Ill., assignor to Symons Corporation, Des Plaines, Ill.

Division of Ser. No. 658,515, Feb. 17, 1976, Pat. No. 4,034,957.
This application June 21, 1976, Ser. No. 698,078
Int. Cl.² E04G *25/04*
U.S. Cl. 52—632 **5 Claims**



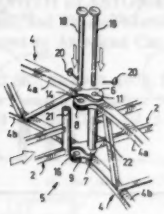
1. An assembly designed for use in supporting or reinforcing concrete formwork and comprising an elongated structural member and a pair of identical but reversely positioned extender members located at one end of the structural member and adapted to extend the effective length of said member, said structural member being generally in the form of an I-beam and embodying a pair of longitudinally extending spaced apart flange arrangements and a connecting web between the arrangements, each of said extender members being of channel shape construction and consisting of parallel outwardly extending side flanges connected together by a medial bight portion and provided along their distal side edge regions with coplanar out-turned flanges, said extender members having their inner end portions positioned on opposite sides of said one end of the structural member in back-to-back fashion and with their bight portions lying flatly against the opposite sides of the web of the structural member, having their outer end portions projecting outwards beyond said one end of the structural member, and being adjustable lengthwise of the structural member by sliding them inwards or outwards, means for releasably clamping said extender members in any of their various adjusted postions, and at least one filler strip secured fixedly within one of the spaces which exist between the projecting outer end portions of the side flanges of the extender members and the corresponding portions of their coplanar out-turned flanges, said filler strip having the outer side surface thereof flush or coplanar with the outer surfaces of the adjacent flange arrangement of the structural member.

4,070,846

SUPPORTING FRAMEWORK FOR A SHELTER SHED

Pentti Aimo Johannes Sohlberg, Paneliantie 48 A, 00940 Helsinki 94, Finland

Filed Oct. 1, 1976, Ser. No. 728,853
Claims priority, application Finland, Oct. 10, 1975, 752824
Int. Cl.² E04B 1/32
U.S. Cl. 52—641 7 Claims



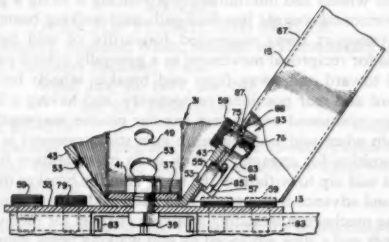
1. In a shelter shed supporting framework of the type including a plurality of support arches each made up of a plurality of arch elements with the ends positioned in adjacency for interconnection with one another and with traverse beams interconnecting the arches at predetermined distances apart; the provision of spaced pairs of articulated point means at adjacent ends of the arch elements and beams for interconnecting the same and comprising double brackets arranged in spaced pairs at the ends of adjacent arch elements with one double bracket in substantial alignment with the outer edge of its associated arch element and with the other double bracket in substantial alignment with the inner edge of its associated arch element and with coaxial holes through the brackets of each pair; tube-like elements carried at opposite ends of each beam and being parallel to one another and of a length corresponding to the distance between adjacent brackets of each double bracket and fitting therebetween with the openings through the tube-like elements in coaxial alignment with respective pairs of holes in the brackets; and fastening pins extending through aligned bracket holes and tube-like elements for connecting the arch elements and transverse beams at the joint means; the axes of the holes through the spaced brackets of each pair being parallel with the radius of curvature of the support arch whereby successive arch elements can be pivoted side-by-side about the axis of either spaced brackets when the pin through the other spaced brackets is removed.

4,070,847

SPACE FRAME STRUCTURE

Joseph Madl, Jr., 990 Volante Drive, Arcadia, Calif. 91006

Filed Dec. 2, 1976, Ser. No. 746,967
Int. Cl.² E04H 12/10
U.S. Cl. 52—650 16 Claims



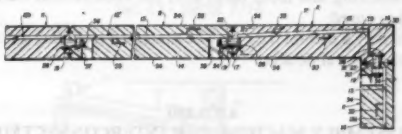
1. A modular space frame structure comprising:
a bottom horizontal modular chord structure having a plurality of chord members connected at their ends forming a grid pattern;
a top horizontal modular chord structure having a grid pattern offset from said bottom grid pattern so that the intersections of the top grid are directly over the centers of the openings in the bottom grid;
an intermediate truss structure connected between said bottom and top chord structures having a plurality of diagonal web members each connected from an intersection of the bottom chord members to an intersection of the top chord members; and
a connector at each said intersection for interconnecting said chord members and web members;
said connector including a cup shaped member having four inclined flat sides each extending along one of said diagonal web members;
threaded means connecting each of said flat sides to its related web member;
reinforcing means connected between adjacent flat sides but not extending outward beyond the planes of said flat sides; and
each said diagonal web member being connected to a top connector on one face of said web member and to a bottom connector on the opposite face thereof so that the top and bottom connections are the same but inverted.

4,070,848

FASTENING BAR ASSEMBLY FOR FRAMELESS INSULATING PANELS

Cleo M. Lingle, 1201 Montclair, Longview, Tex. 75601

Filed Apr. 28, 1977, Ser. No. 791,875
Int. Cl.² E04B 1/41
U.S. Cl. 52—707 3 Claims



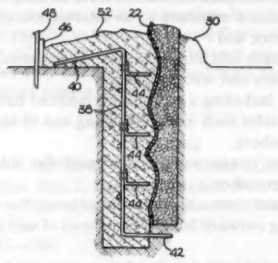
1. In a fastening bar assembly for connecting adjacent insulated panels of an insulated enclosure, a bar body adapted for encapsulation in a foam core of an insulating panel, an apertured anchor plate on one end of the bar body, and a pod formed of low heat conducting material on said apertured anchor plate, said pod being of unit construction and having a through passage from end-to-end thereof, said through passage being internally screw-threaded in a region inwardly of and between the opposite ends of said pod, at least one end of the pod having a recess leading into said screw-threads for the guidance of a screw fastener element into the screw-threads, said pod having a flange plate on its opposite end extending beyond the peripheral surface of the pod and having at least one straight edge engaging a flat face of the fastening bar assembly and resisting rotation of the pod on said apertured anchor plate, and the pod having a forwardly tapering locking bead spaced somewhat forwardly of the flange plate in parallelism therewith and adapted for snapping through the aperture of the anchor plate to hold the pod captive on the anchor plate with the bead on one side thereof and the flange plate on the other side thereof.

4,070,849

METHOD OF FORMING WALLS FOR POOLS, WATERFALLS AND THE LIKE

Philip A. DiGiacomo, 13246 Chandler Blvd., Van Nuys, Calif. 91401

Filed Jan. 2, 1976, Ser. No. 646,243
Int. Cl.[2] E04B 21/02
U.S. Cl. 52—742 6 Claims



1. A method of simulating a natural rock surface comprising the steps of:

a. applying a material on the surface of said natural rock to form a mother mold having a surface form conforming to said surface of said natural rock;

b. applying polyurethane to said mother mold such that said polyurethane foams in place to form a mold panel, said polyurethane supporting said mother mold against hydrostatic pressures such that said surface form of said mother mold conforming to said natural rock surface does not distort, said mold panel being constructed of a closed cell semi rigid foam so as to avoid unnecessary water absorption and to provide sufficient support against typical hydrostatic pressures to which the mold may be subjected.

c. removing said mold panel from said natural rock surface;

d. supporting said mold panel with the exposed face of said mold in the desired location of the simulated surface;

e. providing a cementitious material against said exposed face of said mother mold; and

f. removing said mold panel after the cementitious material has cured;

whereby a natural rock may be simulated including many of the natural details.

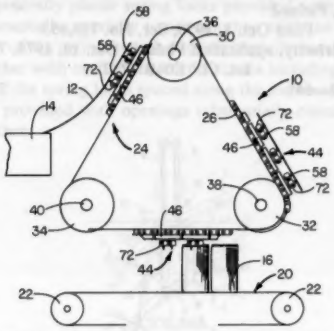
4,070,850

ASSEMBLY MACHINE FOR INTERCONNECTED CARRIER DEVICES

Ernest Ray Cunningham, Libertyville, Ill., assignor to Grip-Pak, Inc., St. Louis, Mo.

Filed Feb. 24, 1977, Ser. No. 771,565
Int. Cl.[2] B65B 13/02, 17/02, 27/04
U.S. Cl. 53—48 11 Claims

1. A bi-directional assembly machine for assembling an interconnected series of plastic carrier devices to containers, comprising conveyor means for moving a plurality of containers in at least one row in a predetermined linear path, and carrier assembly means arranged to move in a predetermined closed path coinciding with said linear path along a portion thereof, said carrier assembly means being capable of bi-directional assembly of the interconnected series of carriers to containers and including means for assembling the interconnected series of carriers to said moving row of containers beginning generally transverse to the movement of said containers along a first container margin with assembly movement toward a second container margin when said carrier assembly means is operated in one direction in said closed path, said means for assembling the interconnected series of carriers to containers also being capable of moving generally transverse to the movement of said containers first along said second container margin with assembly movement toward said first container margin when said assembly means is operated in a second direction in said closed path.

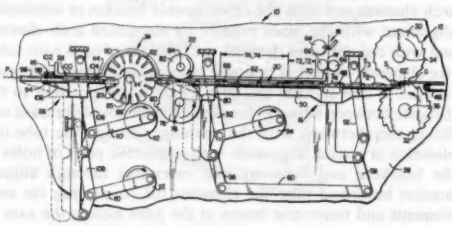


4,070,851

GUM STICK WRAPPING MACHINE

Lawrence W. Schoppee, Springfield, Mass., assignor to Package Machinery Company, East Longmeadow, Mass.

Filed June 23, 1976, Ser. No. 698,957
Int. Cl.[2] B65B 11/46
U.S. Cl. 53—228 16 Claims



1. A gum stick wrapping machine comprising a gum breaking mechanism for separating prescored slabs of gum into individual sticks and including upper and lower toothed breaker wheels journalled for rotation about parallel axes with the teeth thereof in intermeshing relation to form a nip therebetween and means for rotating said breaker wheels in opposite directions at the same peripheral rates, said lower breaker wheel having an annular groove opening outwardly through its peripheral surface, means for feeding prescored slabs into said nip, a first transporting and folding mechanism including a walking beam gum stick transport for receiving each successive stick at said nip as it is separated from a slab by said breaker wheels and intermittently advancing it along a generally horizontal straight line feed path, said walking beam gum stick transport being supported forwardly of said breaker wheels for reciprocal movement in a generally orbital path of travel toward and away from said breaker wheels between forward and rear positions, respectively, and having a finger thereon positioned within said annular groove rearwardly of said nip when said walking beam gum stick transport is in its rear position for engaging a stick upon its separation from a slab at said nip to withdraw the stick from the breaker mechanism and advance it along said feed path, said transporting and folding mechanism including a folding channel for receiving a wrapper and a stick advanced by said walking beam gum stick transport and forming a portion of the wrapper to a generally U-shaped configuration about the stick, said transporting and folding mechanism having at least one folding means associ-

ated with said folding channel for engaging and folding a wrapper formed about a stick as the stick and its associated formed wrapper are advanced within the folding channel by said walking beam gum transport, and means for positioning a wrapper in the path of a stick advanced by said walking beam gum stick transport.

4,070,852

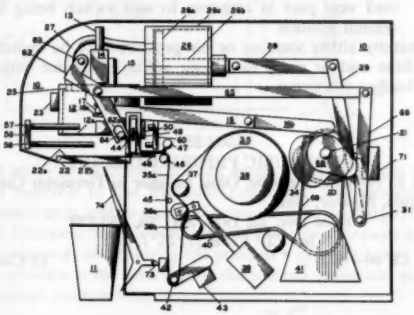
METHOD AND APPARATUS FOR COLD LIDDING CONTAINERS WITH ELASTOMERIC FILM

Richard Patrick Mitchell, and Thomas Mathew Gorshe, both of Neenah, Wis., assignors to American Can Company, Greenwich, Conn.

Division of Ser. No. 642,367, Dec. 19, 1975, Pat. No. 4,011,119. This application Dec. 13, 1976, Ser. No. 749,769

Int. Cl.[2] B65B *7/28;* **B67B** *3/04, 3/08, 3/22*

U.S. Cl. 53—297 **4 Claims**



1. Apparatus for cold lidding an open-top container with roll-stock elastomeric film, comprising:

a. a chassis having a head portion,

b. an open-bottom lidding chamber mounted in said chassis head,

c. a clamping plate mounted in said chassis head below said lidding chamber and having an aperture through which the open-top container to be lidded can be inserted,

d. means for presenting a web of the roll-stock elastomeric film across the bottom of said lidding chamber and above said clamping plate,

e. means for bringing said lidding chamber and clamping plate into mating relationship to clamp said web in air-tight relationship with the bottom of said lidding chamber,

f. means for evacuating said lidding chamber to stretch said web upwardly into said lidding chamber, and

g. means for separating said lidding chamber and said clamping plate from said mating relationship to release said stretched web over the top of a container inserted into said lidding chamber.

4,070,853

OPEN TOP PLASTIC BAG SEALER

Duane Sanders, Spokane, Wash., assignor to Thermoguard Insulation Company, Spokane, Wash.

Filed Jan. 10, 1977, Ser. No. 757,874

Int. Cl.[2] B65B *7/06, 51/14*

U.S. Cl. 53—373 **8 Claims**

1. Apparatus for closing and sealing the upwardly open ends of upright flexible plastic bags that have been filled with a formable material, comprising:

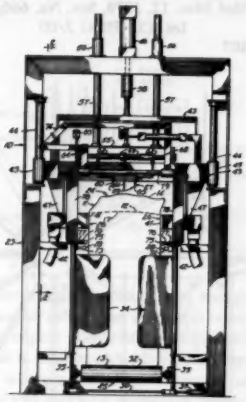
a framework;

bag locating means on said framework for positioning successive bags at a closing and sealing station;

spaced facing suctions means for engaging and forming the open bag end;

a vertically movable carriage on said framework supporting the suction means;

means for moving the carriage vertically from a lowered position wherein the suction means are located at an elevation below the level of material within a bag at the sealing station and a raised position with the suction means at an elevation even with the upwardly open end of the



bag to form the open bag end into a rectangular configuration with integral longitudinal and transverse sides;

folding means for engaging the transverse bag sides and folding them inwardly in such a manner that they become overlapped by the longitudinal sides; and

heat sealing means on said framework adapted to press the longitudinal sides together over the folded transverse sides and fuse the plastic material thereof together.

4,070,854

APPARATUS FOR REMOVING BOTTLE CAPS

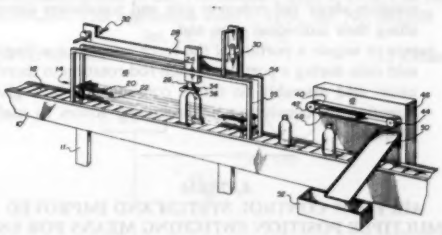
Otto M. Marino, London, Canada, assignor to Labatt Breweries of Canada Limited, London, Canada

Filed Sept. 27, 1976, Ser. No. 726,821

Claims priority, application Canada, Oct. 17, 1975, 237884

Int. Cl.[2] B67B *7/16*

U.S. Cl. 53—381 A **6 Claims**



1. An apparatus for decapping of filled bottles comprising a decapping station, conveyor means for transporting vertically oriented filled bottles, sealed with a crown cap having a dome and skirt, to said station, means defining at least one edge engageable under a lower extremity of the skirt so as to be able to support the associated bottle whilst the bottle is travelling through said station; a chisel-like presser means at said station adapted to move in an elliptical path in a vertical plane above and in the direction of, and substantially synchronous with, bottle travel, whereby the presser means smoothly presses down on the cap dome during travel along the lower limb of the eliptical path whilst the bottle is supported by said edge means, the presser means and edge means combining to deform

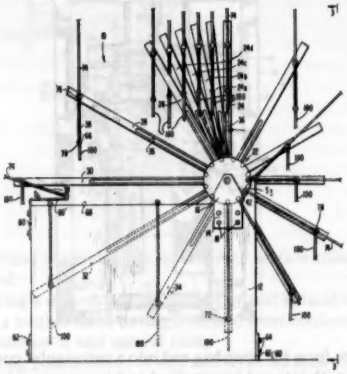
the cap in such a manner that the skirt portion thereof disengages the bottle neck, and means adapted to controllably remove the freed cap overlying the bottle mouth.

4,070,855

CONSTANT FORCE MOTOR

Roy F. Lund, Tanglewood Box 24K, R.D. #5, Muncy, Pa. 17756

Filed Mar. 12, 1976, Ser. No. 666,369
Int. Cl.² F03G *3/00*
U.S. Cl. 60—407 **8 Claims**



1. A constant force motor comprising in assembly:
a plurality of translation rods,
means for mounting said translation rods side by side for pivoting about a common pivot axis at fixed circumferentially spaced positions with respect to each other and for individual translation bidirectionally along their axes during rotation,
means for limiting translation of said rods through said common pivot axis,
means for applying equal constant forces on each rod on respective sides of said common pivot axis with said forces acting in the same fixed direction in the plane of rod rotation to cause, in response to rod shifting along its axis to positions other than that where the pivot axis coincides with the center of said rod, a force imbalance causing rod rotation about the common axis and translation thereof along their individual axes, and
means to negate a portion of the force imbalance acting on said rods during a portion of each rod rotation to thereby cause said assembly to rotate continuously in a given direction by converting unidirectional forces to usable torques.

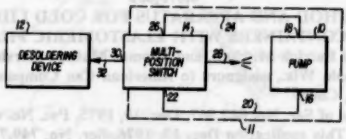
4,070,856

AIR FLOW CONTROL SYSTEM AND IMPROVED MULTIPLE POSITION SWITCHING MEANS FOR USE THEREWITH

Kenneth Curtis Litt, Silver Spring, Md., assignor to Pace, Incorporated, Silver Spring, Md.

Filed Nov. 8, 1976, Ser. No. 739,787
Int. Cl.² F15B *11/06*
U.S. Cl. 60—407 **10 Claims**

1. An air flow control system comprising
an air pump having a vacuum outlet port and an air pressure outlet port;
an air utilization device;
a switch comprising
a switch outlet port connected to said air utilization device;
a vent port;
a vacuum inlet port connected to said air pump vacuum outlet port;
an air pressure inlet port connected to said air pump air pressure outlet port; and
valve means for (a) connecting said vacuum inlet port to said switch outlet port and said air pressure inlet port to said vent port in response to said switch being in a first



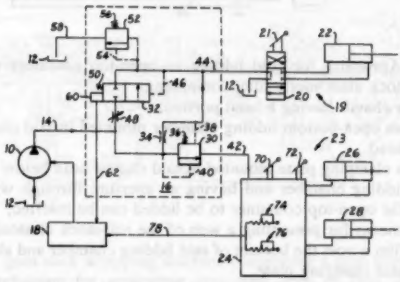
position and (b) connecting said air pressure inlet port to said switch outlet port and said vacuum inlet port to said vent port in response to said switch being in a second position
whereby either vacuum or air pressure may be switched from said air pump to said air utilization device without loading the pump.

4,070,857

HYDRAULIC PRIORITY CIRCUIT

John E. Wible, Painesville, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Filed Dec. 22, 1976, Ser. No. 753,250
Int. Cl.² F15B *11/16, 11/20*
U.S. Cl. 60—422 **12 Claims**



1. A hydraulic priority circuit comprising:
variable output fluid pump means;
a primary work system;
a secondary work system;
valve means for regulating the flow of fluid flow from said pump means to said primary work system and said secondary work system on a priority demand basis, said valve means including indicator means for indicating demand for an increased level of fluid flow to said primary work system, said means actuated upon detecting from said primary work system an increased fluid pressure; and
means responsive to said indicator means for increasing the output of said pump means.

4,070,858

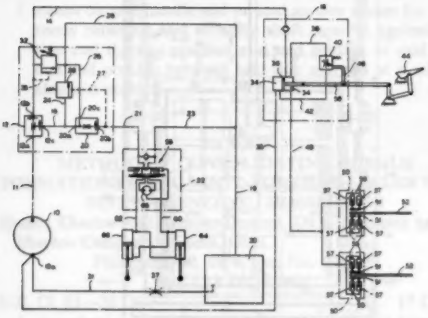
BRAKE AND STEERING SYSTEM

Gene F. Hand, Stevensville, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Continuation-in-part of Ser. No. 729,926, Oct. 6, 1976, abandoned. This application July 18, 1977, Ser. No. 816,241
Int. Cl.² F15B *11/20*
U.S. Cl. 60—422 **6 Claims**

1. A combined brake and steering hydraulic system for a vehicle, comprising a hydraulic pump supplying pressurized

hydraulic fluid, an open center hydraulic brake mechanism, an open center hydraulic steering mechanism, a priority valve receiving the entire fluid output of the said pump and discharging a first portion of said fluid into the said hydraulic brake mechanism and an additional portion into the said hydraulic steering mechanism, a reservoir, conduit means discharging the fluid from the said hydraulic steering mechanism into the



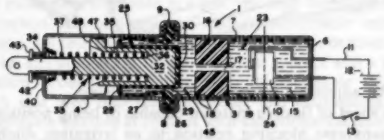
said reservoir, additional conduit means conducting fluid from said reservoir to said hydraulic pump with a predetermined pressure drop, and means conducting the fluid discharged from said hydraulic brake mechanism to said pump by-passing the said reservoir and entering the pump at a pressure lower than the pressure in the reservoir by the amount of the said predetermined pressure drop.

4,070,859

THERMAL FLUID DISPLACEMENT ACTUATOR

Ronald S. Sobecks, Seven Hills, Ohio, assignor to Design & Manufacturing Corporation, Willoughby, Ohio

Filed Dec. 23, 1976, Ser. No. 753,700
Int. Cl.² F03G 7/06
U.S. Cl. 60—530 **9 Claims**



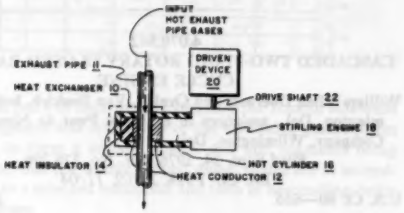
1. A thermal fluid displacement actuator comprising a body, a variable volume fluid chamber in said body formed in part by a diaphragm, a piston assembly on one side of said diaphragm and movable therewith to transmit force by such movement, a fixed volume boiler chamber in said body containing a thermally expansible and contractible force transmitting fluid, heating means to apply heat to at least a portion of said fluid to increase the pressure in the boiler chamber, and barrier means between said boiler chamber and said variable volume chamber, said barrier means having port means therethrough to provide limited fluid communication between said chambers to permit at least some of the fluid remaining in said boiler chamber to be displaced by the increased pressure through said port means to drive said diaphragm and piston assembly through an expansion stroke.

4,070,860

AUTOMOTIVE ACCESSORY ENGINE

Charles M. Hanson, Springfield, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 30, 1976, Ser. No. 755,878
Int. Cl.² F01K 23/10; F02G 1/04
U.S. Cl. 60—616 **3 Claims**



1. In an apparatus for converting heat energy from a heat source to mechanical energy, an apparatus comprising:

a Stirling heat engine comprised of a hot volume in a hot cylinder that is interfaced with a heat source and a heat exchanger, wherein said heat source is an automotive exhaust pipe and said heat exchanger comprises a mass of heat conductor material surrounding a portion of said exhaust pipe and is in intimate contact with said hot volume and a heat insulator material surrounding said mass of heat conductor material and said hot cylinder; and

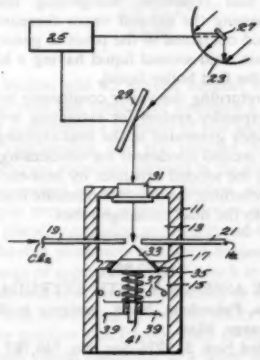
a means for cyclically varying the working fluid volume enclosed within said Stirling heat engine to drive a piston operated crankshaft having a driven device connected thereto wherein rotary motion is imparted to said driven device for doing mechanical work.

4,070,861

SOLAR REACTOR COMBUSTION CHAMBER

Robert L. Scragg, and Alfred B. Parker, both of Miami, Fla., assignors to Solar Reactor Corporation, Miami, Fla.

Continuation-in-part of Ser. No. 657,383, Feb. 10, 1976, Pat. No. 4,026,112, which is a continuation-in-part of Ser. No. 588,888, June 20, 1975, Pat. No. 4,024,715, which is a continuation-in-part of Ser. No. 564,087, April 1, 1975, Pat. No. 3,998,205. This application June 3, 1976, Ser. No. 692,495
Int. Cl.² F03G 7/02
U.S. Cl. 60—641 **12 Claims**



1. A reactor comprising

a reactor chamber;

means for controllably coupling chlorine and hydrogen to said reactor chamber;

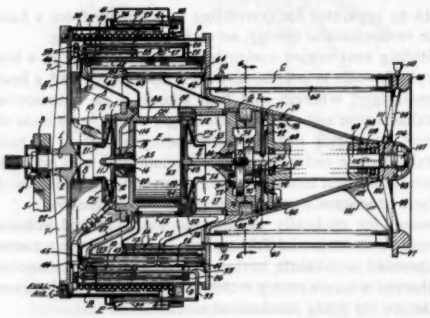
means for directing electro-magnetic radiation into said chamber to thereby ionize said chlorine and hydrogen;
a combustion chamber;
valve means communicating said reaction chamber with said combustion chamber; and
means for controllably coupling oxygen into said combustion chamber, said ionized hydrogen and chlorine passing through said valve into said combustion chamber to exothermically react therein to form hydrogen chloride at a high pressure and temperature level.

4,070,862

CASCADED TWO-FLUID ROTARY CLOSED RANKINE CYCLE ENGINE

William Allen Doerner, and Oral R. Van Buskirk, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 24, 1976, Ser. No. 726,296
Int. Cl.[2] F01K *23/02, 11/04*
U.S. Cl. 60—655 **23 Claims**



1. In a closed, rotary Rankine cycle engine having a rotatable annular boiler-combustor system for introducing heat to the engine, an expander system for extracting work and a condenser rotatable with the boiler-combustor system for removing heat from the engine, the improvement of an engine of cascaded Rankine cycles comprising:
1. a rotatable annular boiler containing a first boiler liquid,
2. means to heat the first boiler liquid in the boiler to generate pressure vapor therein,
3. an expander system for extracting work from the pressure vapor,
4. an annular condenser rotatable with the boiler for condensing the exhaust vapor from the expander by heat-exchange, said condenser comprising heat-exchange, tubes for passing the exhaust vapor thereover to heat a second liquid contained in the tubes to generate pressure vapor therein, said second liquid having a lower boiling point than the first boiler liquid,
5. means for returning the vapor condensate to the boiler,
6. a second expander system for extracting work from the pressure vapor generated in the heat-exchange tubes,
7. a rotatable second condenser for condensing the exhaust vapor from the second expander by heat-exchange, and
8. means for returning the vapor condensate from the second condenser to the heat-exchange tubes.

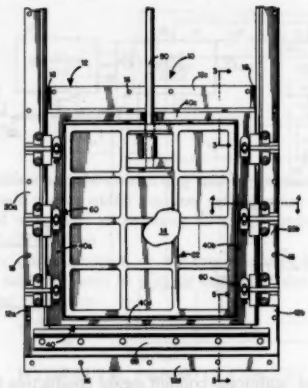
4,070,863

SLUICE GATE ASSEMBLY WITH EXTRUDABLE SEAL

David C. Brown, Petersham, Mass., assignor to Rodney Hunt Company, Orange, Mass.

Filed Nov. 5, 1976, Ser. No. 740,767
Int. Cl.[2] E02B *7/28*
U.S. Cl. 61—28 **9 Claims**

1. A sluice gate assembly comprising: a frame bordering an opening, said frame having first seat facings; a gate disc having second seat facings, said gate disc being movable between a seated closed position at which said second seat facings are urged against said first seat facings, and an open position allowing liquid to pass through said openings; a resilient deformable seal member mounted on said gate disc, said seal member being normally spaced from said first seat facings when said gate disc is in other than the seated closed position; deforming means



carried by and responsive to movement of said gate disc into the seated closed position for deforming said seal member against said first seat facings, said deforming means including a seal retainer interconnected into an integral unit with said seal member and said gate disc; and wedge means for moving said seal retainer relative to said gate disc to produce the aforesaid deformation of said seal member.

4,070,864

ADJUSTABLE IRRIGATION DAM

Kenneth Jarvis, R.R. 2, Box 106, Ulysses, Kans. 67880

Filed Dec. 30, 1976, Ser. No. 755,678
Int. Cl.[2] E02B *7/20*
U.S. Cl. 61—29 **8 Claims**

1. An adjustable irrigation dam comprising:
a. a sheet of flexible material capable of being positioned in transverse blocking relation to an irrigation ditch, said sheet having opposite end portions and a width greater than the width of such ditch whereby side margins overlie areas outwardly of said ditch;
b. an elongated shaft member extending transversely across the irrigation ditch and having opposite end portions positioned laterally outwardly of the ditch;
c. means connecting portions of side margins of said sheet and spaced apart portions at one of the opposite end portions thereof of said shaft member at points adjacent the sides of the ditch for permitting a mid portion between said portions of the side margins of said sheet to sag downwardly from said elongate shaft and permitting said sheet one end portion to be wound around said elongate shaft member upon rotation thereof to raise and lower said mid portion;
d. anchor means selectively positioned on one side of and

outwardly of the ditch and in engagement with one of the opposite end portions of said elongate shaft member for rotatably supporting same and retaining in a selected position relative to the ditch;

e. a handle connected to said elongate shaft member adjacent said anchor means for rotating same to wind said portions the side margins of said sheet one end portion around said elongate shaft and vary the elevation of said mid portion of said sheet one end portion between said side margin portions connected thereto; and

f. means on said handle and on said anchor means for selectively retaining said elongate shaft member against rotation and thereby position said mid portion of said sheet one end portion between said side margins at a selected elevated position.

4,070,865

METHOD OF CONSOLIDATING POROUS FORMATIONS USING VINYL POLYMER SEALER WITH DIVINYLBENZENE CROSSLINKER

Homer Charles McLaughlin, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Mar. 10, 1976, Ser. No. 665,610
Int. Cl.² E02D *3/14*
U.S. Cl. 61—36 C **17 Claims**

1. A method of consolidating a porous permeable formation using a consolidating composition which is not sensitive to pH, carbonates or water comprising contacting said formation with a polymerizable organic liquid mixture of (1) at least one vinyl type monomer having about 3–12 carbon atoms and containing at least one group from phenyl, carboxyl or nitrile and (2) at least one divinyl type monomer having about 3–12 carbon atoms, wherein each of said monomers is soluble in a low viscosity liquid aromatic hydrocarbon solvent; wherein said polymerizable mixture contains a polymerization promoter and a polymerization initiator comprising an organic peroxide, an azo compound or a combination thereof; and maintaining said polymerizable organic liquid mixture in contact with said formation until the monomers in said liquid mixture polymerize with the polymer chain and crosslink, having substantially all hydrocarbon linkages forming a crosslinked consolidated mass having a compressive strength after 24 hours of at least 120 psi.

11. A method of claim 1 of consolidating a porous permeable subterranean earthen formation penetrated by a well comprising mixing a low viscosity polymerizable organic liquid mixture comprising (1) at least one vinyl type monomer having about 3–12 carbon atoms and containing at least one group from phenyl, carboxyl or nitrile and (2) at least one divinyl type monomer having about 3–12 carbon atoms wherein each of said monomers is soluble in a low viscosity liquid aromatic hydrocarbon solvent; wherein said polymerizable mixture contains a polymerization initiator comprising an organic peroxide, an azo compound or combinations thereof and a polymerization promoter; injecting said polymerizable mixture through said well into said formation; and maintaining said polymerizable mixture in contact with said formation until said monomers polymerize, forming a water resistant formation.

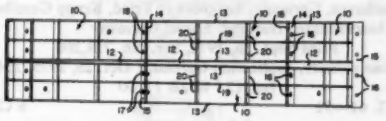
4,070,866

TUNNEL LINERS AND METHODS OF MAKING THE SAME

Ingvald O. Juvrud, Poland, Ohio, assignor to Commercial Shearing, Inc., Youngstown, Ohio

Filed Oct. 8, 1975, Ser. No. 620,802
Int. Cl.² E21D *5/08*
U.S. Cl. 61—45 R **4 Claims**

1. A tunnel liner annulus for changing direction of the liner comprising a plurality of end to end liner segments bolted together at the ends, sealing means between adjoining ends, said liner segments each comprising a pair of liner plates each having a curved elongated skin forming an arc of said annulus, each skin having spaced dependent sidewalls bent at an angle thereto, each successive pair of liner plates in the annulus being in spaced apart side-by-side relationship, spaced apart a greater distance at one end than at the other end, a pair of wedge shaped gusset plates in spaced parallel planes fixed to the sidewalls betwen said liner plates adjacent the top and bottom respectively of the adjacent sidewalls and an end plate at each



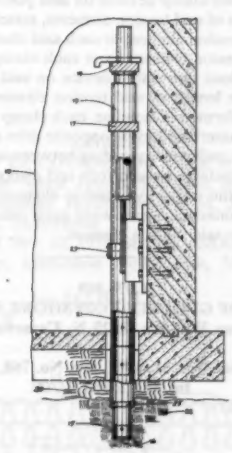
end of said pairs of liner plates extending the remote sidewalls of each segment and connected to the sidewalls, gusset plates and skins to form a unitary whole, and said segments being arranged so that the wedge shaped gusset plates are in ascending order to a selected maximum and then in descending order to a minimum.

4,070,867

NEGATIVE FRICTION PILE AND ISOLATING CASING

Paul G. Cassidy, Glen Ellyn Road, Bloomingdale, Ill. 60108

Continuation-in-part of Ser. No. 532,755, Dec., 1974, which is a continuation of Ser. No. 401,164, Sept. 27, 1973, abandoned.
This application May 9, 1977, Ser. No. 795,206
Int. Cl.² E02D *5/22, 27/44*
U.S. Cl. 61—53 **6 Claims**



1. A skin friction pile for driven support in positive skin friction soil to raise and support or underpin a building structure, said pile comprising a plurality of pile sections in end-to-end abutting relationship, said pile sections being connected together by internal couplings secured in the pile sections, and a casing independent of said skin friction pile surrounding certain said pile sections in negative friction soil, said casing comprising a plurality of casing sections in end-to-end abutting relationship having minimum clearance around the pile sections in the range of approximately 1/64 inch to approximately 5/32 inch, said skin friction pile extending to depths substantially greater than said casing for support solely in positive skin friction soil by positive skin friction only of such soil bearing on the pile, said casing extending to a lesser depth than said skin friction pile through negative friction soil and isolating said certain pile sections from said negative friction soil, said minimum clearance repelling the entrance of soil between the pile sections and the casing sections thereby enabling the pile

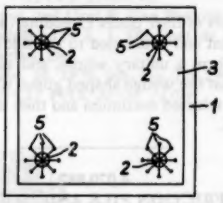
sections to be driven to greater depths than said casing sections.

4,070,868

OFF-SHORE DRILLING PLATFORM AND METHOD OF MOUNTING

Franz Sedlmayer; Paul Baron, and Klaus Seifert, all of Wilhelmshaven, Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Sept. 30, 1976, Ser. No. 728,200
Claims priority, application Germany, Oct. 25, 1975, 2547890
Int. Cl.[2] E02B 17/00
U.S. Cl. 61—91 6 Claims



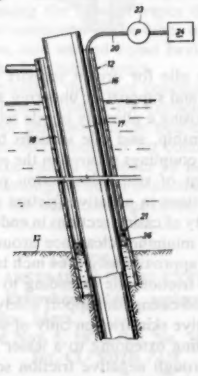
1. In an off-shore drilling platform structure; a base body, legs connected to and upstanding from the base body, a floatable platform slidable on said legs, flexible tension elements extending between the upper ends of said legs and said base body, at least two clamp devices on said platform engageable with at least one of said tension elements, means for selectively clamping said tension element to each said clamp device or for releasing the tension element from each clamp device, means for moving at least one clamp device on said platform in the direction of the length of said tension elements, said tension elements being formed of lamellae, each clamp device comprising a pair of counterbearings on opposite sides of the respective tension element, pull rods extending between said counterbearings, members slidable on said rods and disposed between the laminations of the respective tension element, and means for urging said counterbearings toward each other to clamp said clamp device to said tension element.

4,070,869

METHOD OF GROUTING OFFSHORE STRUCTURE

Kenneth Anthony Williams, 3525 N. Causeway, Metaire, La. 70002

Filed Feb. 14, 1977, Ser. No. 768,165
Int. Cl.[2] E02D 21/00
U.S. Cl. 61—100 4 Claims



1. In a method of grouting an offshore structure having a generally vertically extending outer jacket extending upwardly from the sea bed and a pile mounted inside said jacket, said pile being of a smaller outside diameter than the inside diameter of said jacket to form an annular space therebetween, the combination of steps comprising:

introducing a tube having an outside diameter smaller than the radial thickness of said annulus space downwardly through said annular space until the lower end of said tube is proximate the bottom portion of said annular space which is to be grouted;

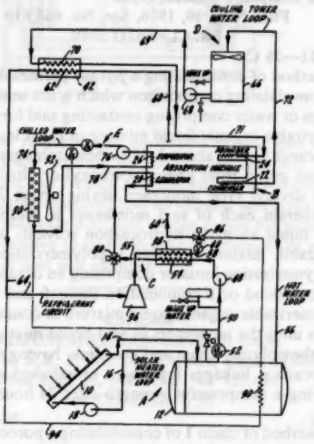
and pumping grout down said tube and up said annular space to thereby displace water from said annulus and fill said annulus with a column of grout.

4,070,870

HEAT PUMP ASSISTED SOLAR POWERED ABSORPTION SYSTEM

Vijay Omprakash Bahel, Schaumburg, and Richard Kuehner, Mount Prospect, both of Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Oct. 4, 1976, Ser. No. 729,502
Int. Cl.[2] F25B 27/00, 27/02, 13/00
U.S. Cl. 62—2 3 Claims



1. A combination heating and cooling system comprising: a solar collector producing a heated fluid; an absorption machine having a generator, a condenser, an absorber, and an evaporator all connected in a closed circuit, continuous cycle absorption system, said evaporator being adapted to cool a fluid to be circulated to a load; a compression cycle system including a condenser and an evaporator through which a refrigerant is circulated; and means for circulating said heated fluid from said solar collector in series flow through said compression cycle system condenser and said generator.

4,070,871

METHOD OF COLD PRODUCTION AND DEVICES FOR THE PRACTICAL APPLICATION OF SAID METHOD

Maurice de Cachard, La Tronche; Robert Moracchioli, Seyssinet, and Gérard Marie, Eybens, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Oct. 1, 1975, Ser. No. 618,576
Claims priority, application France, Oct. 8, 1974, 74 33849
Int. Cl.[2] F25B 1/02, 1/04
U.S. Cl. 62—116 8 Claims

1. A method of refrigeration by means of: a condenser for liquefying a refrigerant, a vaporizer for vaporizing some of the liquefied refrigerant and thereby absorbing heat provided from a heat source for powering refrigeration cycle, an evaporator for evaporating some of the refrigerant and thereby refrigerating a space to be cooled, and a vapor-driven variable-volume

machine having a variable-volume chamber, an energy-storing rotary member, a single outlet, and separate first and second inlets, comprising the steps of:

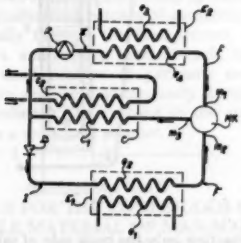
passing a portion of the liquid refrigerant output of said condenser to said evaporator;

vaporizing said portion of said liquid refrigerant in said vaporizer while absorbing heat in said refrigerant from a heat source provided for powering a refrigeration cycle;

concurrently with said vaporizing step, passing another portion of the liquefied refrigerant output of said condenser to said evaporator and evaporating said last-mentioned portion of said condenser output in said evaporator to provide cooling;

feeding the output vapor of said vaporizer to the said first inlet of said variable-volume machine and simultaneously feeding the output vapor of said evaporator to said second inlet of said variable-volume machine;

operating said variable-volume machine by the substeps of:



admitting to the variable-volume chamber of said machine, through said first inlet, a quantity of output vapor of said vaporizer and permitting it to perform first isobaric work and then polytropic work to increase the volume of the chamber while storing energy in the flywheel,

admitting to said variable-volume chamber, through said second inlet at constant pressure, a quantity of the output vapor of said evaporator and thereby accelerating the increase of the chamber volume to its maximum,

utilizing the energy stored in the energy-storing rotary member to compress both said quantities of vapor, together, in a polytropic process by reduction of the volume of said chamber, and

discharging said quantities of vapor to the input of said condenser in an isobaric process when the volume of said chamber approaches its minimum, and

converting said vapor discharged by said machine to the liquid state in said condenser.

4,070,872

UNIVERSAL JOINT

Werner Krude, Neunkirchen, Germany, assignor to Uni-Cardan AG, Lohmar, Germany

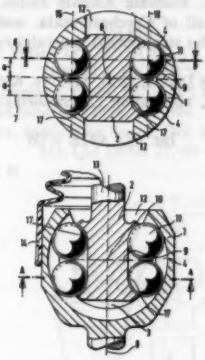
Filed Sept. 23, 1976, Ser. No. 725,924

Claims priority, application Germany, Sept. 25, 1975, 2542733

Int. Cl.² F16D *3/30*

U.S. Cl. 64—21 **5 Claims**

1. A universal joint comprising a hollow joint member having a spherical inner surface therein and there being two circular grooves in said inner surface, an inner joint member within said outer joint member and having an outer surface with recesses therein, balls jointly received in said outer joint member grooves and said inner member recesses to transmit torque therebetween, the centerlines of said outer member grooves defining first planes which are parallel to each other and parallel with the rotary axis of the outer joint member, said first planes being positioned on opposite sides of said rotary axis and spaced equidistantly therefrom, said inner member recess having means for guiding movements of the balls therein along centerlines in second planes perpendicular to said first planes.



4,070,873

START UP COURSE FOR SOCK WELT

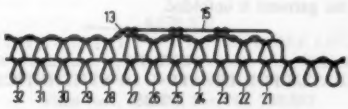
Josephus Johannes Maria Jansen, Schijndel, Netherlands, assignor to Koninklijke Textielfabrieken M. Jansen de Wit B.V., Schijndel, Netherlands

Filed Nov. 20, 1975, Ser. No. 633,832

Claims priority, application Netherlands, Nov. 21, 1974, 7415190

Int. Cl.² D04B *9/46*

U.S. Cl. 66—172 R **3 Claims**

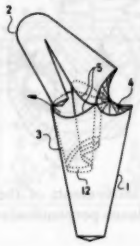


1. A method of knitting a sock on a circular knitting machine wherein for casting on purposes the end extent of knitting yarn is engaged by a first series of needles between a feeder and a clamping means at the knitting point, characterized in that, with the clamping means as seen in the direction of rotation of the needle cylinder located before the knitting point, the feeder is brought behind the knitting point and, after engagement of the end extend of the knitting yarn by the first series of needles, the feeder is moved to a yarn feeding position before the knitting point, with a number of needles positioned between and adjacent to the first series of needles brought into a position in which the yarn is not engaged thereby during such movement of the feeder to position before the knitting point, whereby the end extent of the yarn is maintained in the form of a single open loop during one course and is included in the fabric by the needles initially not engaging the yarn during the knitting of the subsequent courses.

4,070,874
ONE PIECE PANTYHOSE AND METHOD OF MANUFACTURING SAME

Drahomir Zouhar, Blansko; Antonin Holas, and Ivan Musil, both of Brno, all of Czechoslovakia, assignors to Elitex - Zavody textilniho strojirenstvi generalni reditelstvi, Liberec, Czechoslovakia

Filed Dec. 1, 1975, Ser. No. 636,432
Claims priority, application Czechoslovakia, Dec. 12, 1974, 8472/74
Int. Cl.[2] A41B 9/08
U.S. Cl. 66—177 5 Claims



1. A folded, knitted pantyhose garment comprising first and second tubular limb portions, a third tubular body portion, and a crotch portion having an outer periphery, the first, second and third portions having mutually joined first open ends, the first, third and second portions being arranged substantially coaxially one within the other in radial inward succession with their respective first ends facing in the same direction, the inwardly facing surface of the outermost first portion confronting the outwardly facing surface of the third portion, the outwardly facing surface of the innermost second portion confronting the inwardly-facing surface of the third portion, a first half of the circumference of the first end of the third portion being joined directly to a corresponding adjacent first half of the circumference of the first end of the first portion, the remaining half of the circumference of the first end of the third portion being joined directly to the adjacent half of the circumference of the first end of the second portion, the remaining halves of the circumference of the first ends of the respective first and second portions being joined by the outer periphery of the crotch portion, whereby the above-mentioned outwardly-facing surfaces of the first and second portions of the folded garment remain the outwardly-facing surfaces of said portions when the garment is unfolded.

4,070,875
APPARATUS FOR TREATING OF SYNTHETIC TEXTILE WEBS

Johannes Kutz, St. Tonis near Krefeld, Germany, assignor to Eduard Kusters, Krefeld, Germany

Continuation of Ser. No. 440,026, Feb. 6, 1974, abandoned. This application Oct. 7, 1976, Ser. No. 730,159
Claims priority, application Germany, Feb. 7, 1973, 2305932
Int. Cl.[2] D06B 3/22
U.S. Cl. 68—3 SS 9 Claims

1. In an arrangement for treating a textile web having a pile in which the web is required to enter and leave a treatment station with its pile facing upward, an apparatus for positioning the pile threads of a textile web fabricated from heat sensitive, synthetic material, which is comprised of:

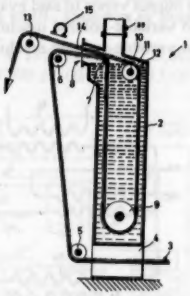
a. means in the form of a substantially vertical tank having a top and a bottom and spaced sides extending substantially vertically betwen said top and bottom for storing a heated liquid of predetermined temperature, said means having an inlet and outlet opening in one of said spaced sides near the top of said means;

b. means to guide the textile web into said means for storing and from said means for storing through said opening such that the textile web enters said means for storing below the point at which the textile web exits said means for storing, for storing said means filled with said heated liquid to a level closely adjacent the point where the textile web enters said means for storing;

c. a passageway of width at least equal to the width of the textile web under said means for storing;

d. means for routing said textile web through said passageway beneath said means for storing from the one of said sides opposite said opening and upward to said opening and into said heated liquid;

e. means for guiding said textile web through said heating liquid, first vertically downward and then vertically upward, for a predetermined period of time, said guide



means contacting only the back side of said web, and said web being contacted by no other structure while within said heated liquid;

f. means disposed approximately at the top of said heated liquid and within said means for storing for changing the direction of said web from vertical to substantially horizontal thereby bringing said web to a substantially horizontal position immediately after removal from said heated liquid; and

g. means for maintaining said web after removal from said heated liquid substantially horizontal for a second period of time, said means for maintaining in cooperation with said means for changing also directing said web out of said means for storing through said opening in said means for storing.

4,070,876
APPARATUS FOR VAPOR PHASE TREATING GARMENTS

Richard D. Thompson, Cincinnati, Ohio; Douglas Thompson, Salt Lake City, and Micheal G. Beeley, Logan, both of Utah, assignors to McGraw-Edison Company, Elgin, Ill.

Division of Ser. No. 438,587, Feb. 1, 1974, Pat. No. 4,032,294.
This application July 20, 1976, Ser. No. 707,061
Int. Cl.[2] D06M 13/14
U.S. Cl. 68—3 R 2 Claims

2. Apparatus for vapor phase treating garments, each having cellulosic or natural protein fibers therein and being supported in a substantially wrinkle-free condition on a form, with moisture, formaldehyde, and sulfur dioxide, comprising:

a. separated first, second, third and fourth enclosed chambers;

b. conveyor means for indexing a first batch of garments successively and sequentially through the first, second, third and fourth chambers, and for stopping the batch of garments in each chamber for exposure to an atmosphere therewithin;

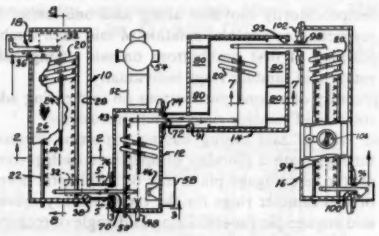
c. means to introduce steam to the first chamber to moisten such garments therewithin;

d. means to introduce formaldehyde and sulfur dioxide va-

pors to the second chamber for penetration onto such garments therewithin;

e. means to introduce heated dry air to the third chamber to dry such garments therewithin;

f. means to introduce heated moist steam to the fourth chamber to vapor clean the garments and remove formaldehyde odor therefrom; and



g. said conveyor means also being operable to index subsequent equally sized batches of garments successively and sequentially through the first, second, third and fourth chambers, and to stop them at each, so that successive equally sized batches of garments are simultaneously indexed to and are simultaneously stopped in the respective chambers to be exposed to the atmospheres therewithin in a sequential manner.

4,070,877

APPARATUS FOR THE CONTINUOUS STEAMING OF TEXTILE MATERIAL OF MAN-MADE FIBER MATERIAL

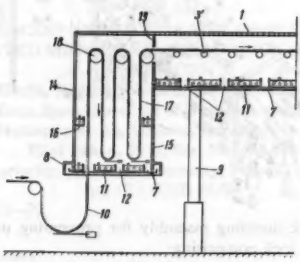
Hans Fleissner, Riehen, Switzerland, assignor to Vepa Aktiengesellschaft, Switzerland

Division of Ser. No. 439,049, Feb. 4, 1974, Pat. No. 3,949,577. This application Oct. 28, 1975, Ser. No. 626,539

Claims priority, application Germany, Feb. 2, 1973, 2305155; Feb. 2, 1973, 2305154; Mar. 1, 1973, 2310195; June 9, 1973, 2329687

Int. Cl.[2] D06B *3/02*

U.S. Cl. 68—5 D **3 Claims**



3. An apparatus for the continuous steaming of textile material or man-made fiber material in this material and synthetic fibers which comprises at least one bell-shaped housing providing a treatment chamber closed all around by sidewalls and at least partly opened at the bottom, means for supplying steam into said chamber, and at least one conveying means for transporting the material within the housing, so that the material extends from below and into the housing and extends out of the housing at the bottom thereof; said means for supplying steam into said chamber including water sump means extending along the bottom portion of said bell-shaped housing; said water sump means having a plurality of open containers spaced from each other to provide openings for removal of air from the textile material being treated within the steam housing, at least one of said containers defining a portion of an opening that forms an inlet passage for the material entering said housing and at least one other container defining a portion of an opening that forms an outlet passage for material exiting from said housing.

4,070,878

MACHINE FOR CONTINUOUSLY PROCESSING TEXTILE FABRICS

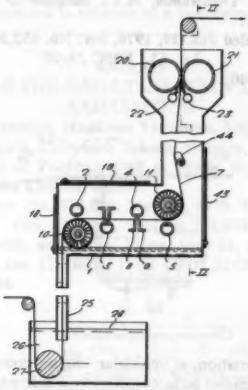
Conrado Valls, Torras y Bases, 53, 1°, 1ª, Barcelona, Spain

Filed Sept. 22, 1976, Ser. No. 725,436

Claims priority, application Spain, Oct. 4, 1975, 441823

Int. Cl.[2] D06B *21/00*

U.S. Cl. 68—22 R **6 Claims**



1. A machine for continuously processing textile fabrics comprising a main processing chamber provided with a plurality of nozzles placed transversally to a continuous textile band to be processed, each nozzle being substantially perpendicular to the textile band, with outlets tangential to said band, the aforesaid nozzles being provided with apertures adapted to eject strong, penetrating and uniform jets of processing liquid over the textile band, means situated opposite the nozzles to receive the processing liquid passing therethrough, said processing chamber terminating in an outlet provided with pressure cylinders and in an inlet comprising a lower passage connecting with a tank for collecting the processing liquid and receiving the textile band for supplementary processing.

4,070,879

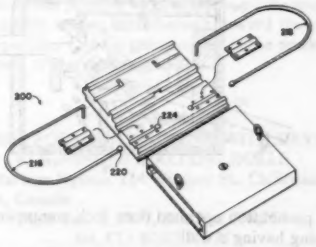
LIGHTWEIGHT-TYPE DETACHABLE LOCK

Philip W. Thompson, Apt. B 5729 Cedonia Ave., Baltimore, Md. 21206

Filed Nov. 4, 1976, Ser. No. 738,893

Int. Cl.[2] E05B *67/02, 67/08*

U.S. Cl. 70—20 **17 Claims**



1. In a lock having a body, hasp structure having a part

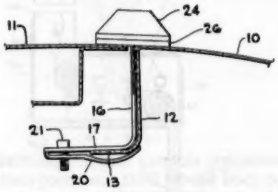
protrusive from the body, means including a first recess for securing a first portion of the hasp structure to the body while permitting a second portion thereof to move relative to said first portion, and means at the body for holding said second portion closed in locking position, the improvement comprising: the means for holding including a cover comprising a tubular member with open ends proportioned for sliding over the body to a position over at least said second portion of the hasp structure; and means for locking the cover in said position.

4,070,880

VEHICLE HOOD LOCK

Jack C. Carl, Tonawanda, N.Y., assignor to McGard, Inc., Buffalo, N.Y.

Filed Jan. 29, 1976, Ser. No. 653,369
Int. Cl.[2] E05C *19/00*
U.S. Cl. 70—240 **5 Claims**



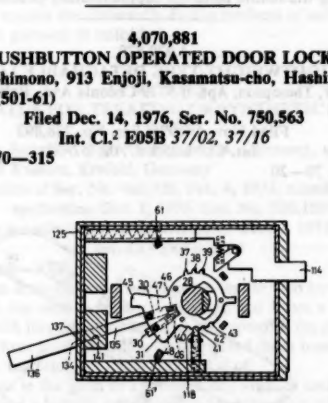
1. In combination, a vehicular engine compartment hood and a body member adjacent thereto, a side edge of said hood extending along and generally flush with said body member, said body member having a recessed stop member for limiting closing movement of said hood, a hood locking device comprising a base portion secured to said stop member which underlies the hood when the latter is in closed position, said locking device having a member extending upwardly from said base between said hood and said fixed body member, said upwardly extending member having screw threads therealong, and a cap nut engageable with said threads with the hood in a closed position and overlying said hood to prevent opening movement thereof, said nut having keying formations in its outer face adapted to coact with a special wrench having complementary keying formations whereby said nut can be removed only by means of said special wrench.

4,070,881

PUSHBUTTON OPERATED DOOR LOCKS

Junichi Shimono, 913 Enjoji, Kasamatsu-cho, Hashima, Gifu, Japan (501-61)

Filed Dec. 14, 1976, Ser. No. 750,563
Int. Cl.[2] E05B *37/02, 37/16*
U.S. Cl. 70—315 **6 Claims**



1. A pushbutton operated door lock comprising:
a casing having a wall;
a lock shaft in said casing;
a lock bolt slidably supported on said lock shaft and having a plurality of notches juxtaposed along the length of said lock bolt;
a plurality of tumbler rings rotatably supported on said lock shaft and juxtaposed along the length thereof, each of said tumbler rings having an outer peripheral edge formed with a plurality of lateral bores;
a plurality of engage pins each having one end received in one of said lateral bores of each of said tumbler rings and reciprocatorily movable along said one lateral bore for restricting an angle of rotation of said each tumbler ring;
a plurality of first pushbuttons on said casing adapted to rotate said tumbler rings individually;
a plurality of second pushbuttons on said casing adapted to rotate said tumbler rings simultaneously;
said wall of said casing having a portion formed therethrough with a plurality of apertures each providing access to said engage pin in any of said lateral bores of one of said tumbler rings for the reciprocatory movement of said engage pin for restricting said angle of rotation of said tumbler ring on the outside of said casing; and
each of said notches being engageable with one of said tumbler rings upon rotation of said one tumbler ring.

4,070,882

LOCK SHIELDING ASSEMBLY

Roberto Ruiz, 1360 Ocean Parkway, Brooklyn, N.Y. 11230

Filed Sept. 20, 1976, Ser. No. 724,967
Int. Cl.[2] E05B *17/14*
U.S. Cl. 70—427 **14 Claims**

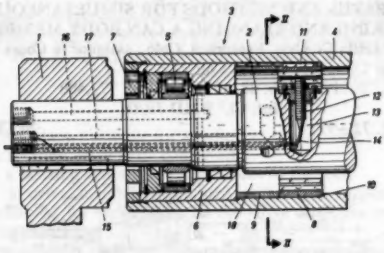
1. A lock-shielding assembly for preventing unauthorized access to a lock comprising:
a housing adapted to be fixedly superimposed over a front face of the lock, said housing having a front wall spaced from the lock face and a slot between said front wall and the lock face, a cooperating opening in said front wall providing access to the lock face;
a shield plate slidably disposed in said slot and movable between said front wall and the lock face from a first position closing said opening and covering the lock face to prevent access thereto through said opening to a second position displaced from said first position to permit access to the lock face through said opening; and
a plurality of threaded pins extending into said front wall, selectable ones of said pins extending through said front wall and into threaded engagement with said shield plate to thereby retain said shield plate in said first position.

4,070,883

SYSTEM AND ASSEMBLY FOR MEASURING THE MOVEMENT OF STRIP AND HOT STRIP MILL

Helmut Kunz, Marchtrenk, and Roland Kofler, Linz, both of Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft, Vienna, Austria

Filed Mar. 28, 1977, Ser. No. 781,640
Claims priority, application Austria, May 3, 1976, 3236/76
Int. Cl.[2] B21B *37/00*
U.S. Cl. 72—14 14 Claims



1. An assembly for measuring the movement of strip, comprising

a non-rotatable axle having an axial bore,

a roller shell rotatably mounted on said axle and engageable with said strip,

a detector non-rotatably mounted on said axle and comprising a magnet which produces a magnetic field and a sensing coil arranged to generate voltage signals in response to magnetic flux changes in said magnetic field,

an annular rotor disposed between said axle and said shell and non-rotatably connected to said shell and movable in said magnetic field and adapted to produce a predetermined magnetic flux change in said magnetic field in response to a predetermined angular movement of said shell, and

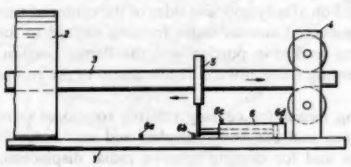
a lead connected to said detector and extending in said axial bore and arranged to transmit said voltage signals.

4,070,884

PROCESS AND DEVICE FOR DE-SCALING ELONGATED METALLIC BARS DURING CONTINUOUS FORMING

Manfred Grube, Bochum; Wilhelm Gorski, Wattenscheid, and Heinz Koch, Sprockhovel, all of Germany, assignors to Fried. Krupp Huttenwerke Ag, Bochum, Germany

Filed Feb. 4, 1977, Ser. No. 765,699
Claims priority, application Germany, Feb. 10, 1976, 2605011
Int. Cl.[2] B21B *45/04*
U.S. Cl. 72—39 2 Claims



1. A process for continuous de-scaling of elongated metallic material, particularly steel, said material having a plurality of successive areas disposed in a longitudinal direction to be de-scaled; said material being defined by a leading section, trailing sections and a section therebetween, said process comprising the steps of:

continuously moving said material in one direction, and simultaneously shaping, particularly by rolling, said material; shaping said material leading section, and subsequently said section between said leading and trailing sections; heating said section between said leading and trailing sections and said trailing sections by the heat of a furnace during the shaping of said leading section;

spraying a fluid, particularly a liquid, within a de-scaling zone on the material under high pressure in a predetermined cycle for a predetermined treatment time at a predetermined degree at each of the successive areas during material movement and prior to said material shaping; and

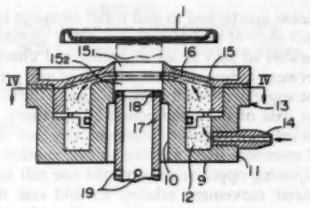
displacing the de-scaling zone in the areas of the material in a direction opposite to the movement of the material at a relatively high velocity enabling material treatment time to be minimized in relation to a quantum of de-scaling.

4,070,885

APPARATUS FOR SIMULTANEOUSLY DEFORMING AND COATING

Yasunori Miyamatsu; Hisakazu Yasumuro, both of Yokohama; Kenichi Miyata, Kawasaki; Takashi Shimizu, and Kikuo Matsuoka, both of Yokohama, all of Japan, assignors to Toyo Seikan Kaisha Limited, Japan

Division of Ser. No. 578,019, May 16, 1975. This application Oct. 12, 1976, Ser. No. 731,570
Claims priority, application Japan, May 21, 1974, 49-56103
Int. Cl.[2] B05C *1/02;* B21D *22/06*
U.S. Cl. 72—46 10 Claims



1. An apparatus for applying a sealant to the inside surface of opening portions of a can end having a curled portion for seaming in order to reinforce it and to prevent leakage of the contents of the can, said apparatus comprising a vertically movable plunger having a top, a stamping die fitted to said plunger top, said stamping die being movable between a lower position and an elevated sealant applying position, a frame defining a chamber surrounding said plunger for accommodating sealant and a cover for said chamber, an inlet port for sealant provided in a side surface of said frame, a central hole provided in each of said frame and said cover so as to permit the vertical movement of the stamping die therethrough, the relative dimensions of said central holes and said stamping die providing a narrow clearance between the stamping die and the central holes thereby removing excess sealant adhering to the periphery of the stamping die, said frame having an inside wall defining said central hole in said frame and a slit formed in the inside wall of the frame below the cover and above said stamping die lower position so as to surround the stamping die for extruding the sealant therethrough toward the upper surface of the periphery of the stamping die at the predetermined lower position of the stamping die.

4,070,886

SPIRAL PIPE FORMING MACHINE WITH DEVICE FOR ALIGNING SPIRALLING ROLLS

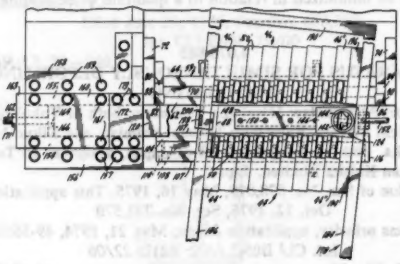
Adrianus Marinus Nyssen, 114 Windsor St., Chilliwack, British Columbia, Canada

Filed Jan. 5, 1977, Ser. No. 756,766
Int. Cl.[2] B21C *37/12*
U.S. Cl. 72—49 17 Claims

1. In an apparatus for continuously forming corrugated

metal pipe from an elongated sheet of metal, the apparatus having a corrugating device to impress longitudinal corrugations in the sheet, a multiple roll pipe forming device for accepting the corrugated sheet and spiralling the sheet into successive, adjacent helical convolutions having a central axis formed at an oblique angle to the axis of the longitudinal corrugations in the sheet, and a seaming device to join adjacent helical convolutions, the improvement comprising:

a. at least one roll of said multiple roll forming device comprising a plurality of adjacent, unconnected parallel roller elements, the periphery of each of said roller elements engaging one surface of said sheet at one point along a series of points generally parallel to the central axis of the helical convolutions, and



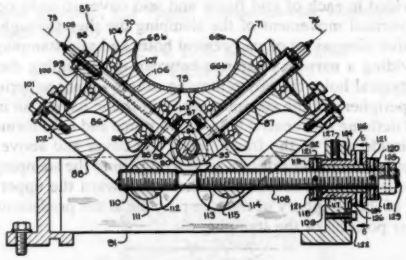
b. means unattached to said roller elements to automatically shift each of said plurality of roller elements along a line parallel to said series of points and change the spacing between adjacent points of each of said series of points as the angle between the central axis of the convolutions and the axis of the longitudinal corrugations in the sheet is varied, said means to automatically shift including a pair of members fixed relative to one another, said members adjoining opposite ends of said one roll and mounted for lateral movement relative to said one roll, said roller elements being continually confined between said members.

4,070,887

ROLL FORMER FOR TUBE MILL

Ralph L. Hankin, Manito Beach, Mich., assignor to Tube Machinery Corporation, Holland, Ohio

Filed Nov. 1, 1976, Ser. No. 737,553
Int. Cl.[2] B21D *22/10*
U.S. Cl. 72—52 **7 Claims**



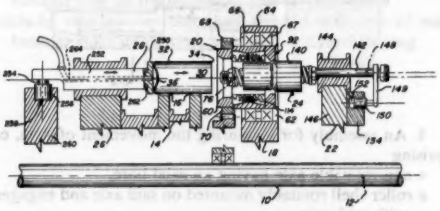
1. In a mill for forming a tube from an elongated flat strip of metal, an improved roll former for imparting a predetermined symmetrical curve to such strip comprising, in combination, first and second shafts, means mounting said first shaft to pivot in a plane about a point in such plane, means mounting said second shaft in such plane to pivot about said point, adjustment means for simultaneously pivoting said shafts in such plane equally in opposite directions about said point whereby said shafts may be selectively pivoted towards and away from one another, a symmetrical first roller mounted to rotate on said first shaft about an axis of symmetry, and a symmetrical second roller mounted to rotate on said second shaft about an axis of symmetry, said first and second rollers each having contoured external surface means for imparting one half of the predetermined symmetrical curve to such strip when such strip is longitudinally advanced between said rollers.

4,070,888

APPARATUS AND METHODS FOR SIMULTANEOUSLY NECKING AND FLANGING A CAN BODY MEMBER

Laszlo Attila Gombas, Evergreen, Colo., assignor to Coors Container Company, Golden, Colo.

Filed Feb. 28, 1977, Ser. No. 772,480
Int. Cl.[2] B21D *19/06*
U.S. Cl. 72—91 **20 Claims**



1. Apparatus for simultaneously necking and flanging an unformed end portion next adjacent a rim portion of a side wall portion of a sheet metal can body member to form a curved necked-in wall portion in the unformed end portion next adjacent and connected to the side wall portion and to form a radially and axially outwardly extending flange portion between the formed curved necked-in portion and the rim portion; and comprising:

support means for supporting the can body member during a necking and flanging operation;

outer forming means mounted without the can body member in radially outwardly spaced relationship to and in axial alignment with the unformed end portion and having a curved annular outer forming surface extending thereabout for engaging circumferentially variable portions of the outer peripheral surface of the unformed end portion to form the curved necked-in portion and the flange portion;

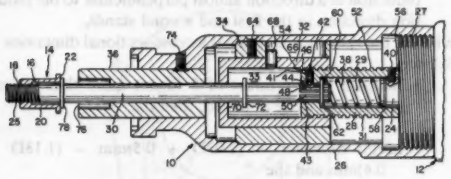
inner forming means mounted within the can body member in radially inwardly spaced relationship to and in axial alignment with the unformed end portion and having first and second axially oppositely displaceable annular inner forming surfaces for engaging axially spaced portions of the inner peripheral surface of the unformed end portion located on axially opposite sides of the center of curvature of the curved annular outer forming surface to form the curved necked-in portion and the flange portion while preventing radial inward displacement of the rim portion; and

actuating means for causing relative rotational movement between said can body member and said outer forming means and for causing relative radial displacement between said can body member and said outer forming means to engage said curved annular outer forming surface with circumferentially variable portions of the outer peripheral surface of said unformed end portion and progressively move the curved annular outer forming surface radially inwardly relative to the can body member until the curved necked-in portion and the flange portion have been formed in the unformed end portion.

4,070,889
LINEAR PULL SETTING TOOL

Charles J. DeCaro, Marshfield, Mass., assignor to Textron Inc., Providence, R.I.

Filed Oct. 14, 1976, Ser. No. 732,313
Int. Cl.[2] B21J 15/12
U.S. Cl. 72—114 14 Claims



1. An adapter suitable for attachment to a driving tool having a rotating drive shaft comprising:

A. a housing adapted for attachment to the tool;

B. a drive member positioned within the housing and adapted for securement to the drive shaft for rotation therewith;

C. an adapter shaft coaxially extending through the adapter and having a rearward end and a forward end, said rearward end including means for rotative cooperation with the drive member and said forward end adapted for association with a fastener;

D. a movable inner sleeve positioned about the adapter shaft;

E. means associated with the drive member for engaging an end of the inner sleeve for advancing the inner sleeve along the drive member;

F. means associated with the inner sleeve for preventing rotation of the sleeve relative to the drive member;

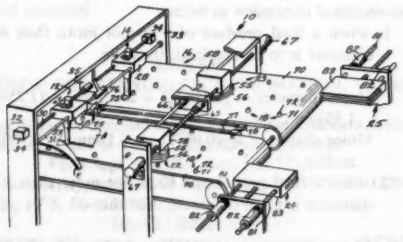
G. pick-up means secured to the adapter shaft and positioned for engagement by the inner sleeve;

whereby in a first position the rotation of the drive shaft is translated through the drive member and the rotative means to cause rotation of the adapter shaft and in a second position the rotative means is removed from cooperation with the adapter shaft and the sleeve advances along the drive member and engages the pick-up means to cause linear movement of the adapter shaft.

4,070,890
METHOD AND APPARATUS FOR CUTTING SHEET METAL WRAPPERS OR THE LIKE

James Henry Stubbings, Rockville, Md., assignor to Potomac Applied Mechanics, Inc., Bethesda, Md.

Filed Jan. 13, 1976, Ser. No. 648,776
Int. Cl.[2] B26D 5/30; B21F 11/00
U.S. Cl. 72—129 13 Claims



1. Apparatus for cutting wrappers and the like from metal sheets, comprising

a. conveyor means for continuously feeding a metal sheet into a cutting position, and past said cutting position, in a given direction *x*,

b. a pair of powered cutting means for cutting said metal sheet along the length thereof as it is fed to said cutting position, each of said cutting means comprises a scissors-like shearing cutting blade arrangement, one of said cutting blade arrangements being a right-hand cutting blade arrangement, and the other of the cutting blade arrangements being a left-hand cutting blade arrangement,

c. means for mounting said cutting means for movement in a y-dimension, said y-dimension being generally perpendicular to said *x* direction,

d. y-motor means for selectively moving said cutting means in said y-dimension,

e. means for mounting said cutting means for rotation about a generally vertical axis, said axis being generally perpendicular to a plane containing said y-dimension and x-direction,

f. α-motor means for rotating said cutting means about said axis of rotation,

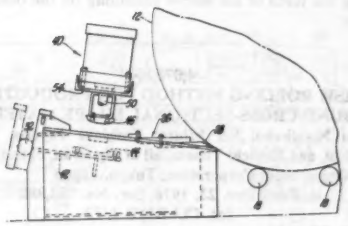
g. means for spacing said metal sheet to be cut from said conveyor means so that said conveyor means is not damaged by said cutting means during cutting therewith,

h. computer control means or the like for controlling said *y* and α motor means to cut wrappers or the like of desired shape and dimension from said metal sheet.

4,070,891
COIL-END PEALER AND DEBENDER

Ivan J. Stretten, 2829 Lakewood Drive, Drayton Plains, Mich. 48020

Filed Dec. 1, 1976, Ser. No. 746,316
Int. Cl.[2] B21C 47/16
U.S. Cl. 72—183 5 Claims



1. A stock roll coil-end debender for use in line and combination with coil-end pealing means, and comprising;

parallel spaced side wall members providing common wall support for and having mounted therebetween said coil-end pealing means, at one end, stock roll feeding means, at the other end, and said coil-end debender therebetween,

said debender including a fixedly located forming die mounted between said common side wall support members and having an upwardly open concavity,

a complimentary forming die provided relatively over said fixedly located forming die for use therewith and having means providing power operated reciprocation thereof mounted on each of said side wall members,

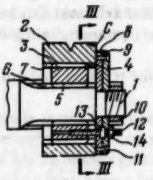
and said forming dies being relatively disposed and spaced as separated to receive a coil end from a stock roll therebetween, being relatively formed for use in straightening said coil end, and being sufficiently close to said stock roll feeding means for subsequent ease in having stock material and coil ends thereof fed thereto and through.

4,070,892

ARRANGEMENT FOR METAL WORKING BY ROLLING

Mikhail Vladimirovich Kholmogorov, ulitsa Trofimova, 20, kv. 50; Jury Vasilievich Katkov, 3 linia, 11, korpus 2, kv. 63, and Alexandr Mikhailovich Gusev, Chernomorsky bulvar, 15, korpus 2, kv. 124, all of Moscow, U.S.S.R.

Filed Dec. 22, 1976, Ser. No. 753,415
Claims priority, application U.S.S.R., Dec. 30, 1975, 2306934
Int. Cl.[2] B21B 31/16
U.S. Cl. 72—195 2 Claims



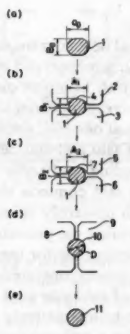
1. In an arrangement for metal working by rolling, comprising parallel shafts, sector dies mounted on said shafts and devices for adjustably rotating the sector dies and for transmitting rotary motion to the sector dies from the shafts, said devices being mounted on said shafts and being reciprocable therealong, wherein the improvement comprises each of said devices for adjustably rotating the sector dies and for transmitting rotary motion thereto from the shafts comprises a sleeve having external and internal surfaces and provided with teeth extending on the external and internal sleeve surfaces at an angle relative to the sleeve axis, the teeth of one of said surfaces extending in opposition to the teeth of the other of said surfaces and differing in number by at least one tooth, each of said shafts provided with first spline means for receiving the teeth of the sleeve extending on the inner surface thereof, and each of the sector dies provided with second spline means for receiving the teeth of the sleeve extending on the outer surface thereof.

4,070,893

FINISH ROLLING METHOD FOR PRODUCTION OF ROUND CROSS-SECTIONAL SHAPE MATERIALS

Michio Nishikubo; Sei Miura; Toshiaki Toyoda; Katsunori Jonishi, and Kouichi Yoneta, all of Muroran, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Dec. 23, 1976, Ser. No. 753,882
Int. Cl.[2] B21B 1/12
U.S. Cl. 72—234 1 Claim



1. A finish rolling method of metal products of round sectional shape comprising:

a. Introducing a starting material of oval cross-sectional shape into a finish rolling train comprising at least a first, a second and a third stand arranged close to each other in the stated order from an inlet side of the train;

b. rolling the starting material into an oval cross-sectional shape with a light reduction from the same direction in the first and second stands; and

c. finish rolling in the third stand the thus light reduced oval material into a round cross-sectional shape with a light reduction in a direction almost perpendicular to the reduction direction in the first and second stands,

wherein the starting material has a cross-sectional dimension as below:

1. when a final product of 5 to not more than 40 mm diameter is to be obtained; then the

Major diameter = (1.07D + 0.5)mm ~ (1.18D + 0.4)mm and the
Minor diameter = (1.01D + 0.2)mm ~ (1.05D + 0.4)mm, and

2. when a final product of 40 to not more than 200 mm diameter is to be obtained; then the

Major diameter = (1.04D + 1.5)mm ~ (1.10D + 3.5)mm and the
Minor diameter = (1.01D + 0.2)mm ~ (1.02D + 1.5)mm

and wherein the starting material which has been rolled in the first and second stands has a cross-sectional dimension as below:

1. when a final product of 5 to not more than 40 mm diameter is to be obtained; then the

Major diameter = (1.0712D + 0.52)mm ~ (1.1865D + 0.45)mm and the
Minor diameter = (0.985D − 0.1)mm ~ 0.998Dmm, and

2. when a final product of 40 to not more than 200 mm diameter is to be obtained; then the

Major diameter = (1.0412D + 1.52)mm ~ (1.1035D + 3.65)mm and the
Minor diameter = 0.985Dmm ~ 0.998Dmm,

the distance of the roll center of the first stand and that of the second stand being not longer than (5.6D + 400)mm and the distance between the roll center of the second stand and that of the third stand being not longer than (4.6D + 320)mm and wherein the rolling groove of the first and second stands has a cross-sectional dimension as below:

1. when a final product of 5 to not more than 40 mm diameter is to be obtained; then the

Major diameter = (1.1412D + 2.02)mm ~ (1.2565D + 1.95) mm, the
Minor diameter = (0.985D − 0.1)mm ~ 0.998Dmm, and

2. when a final product of 40 to not more than 200 mm diameter is to be obtained; then the

Major diameter = (1.0912D + 4.02)mm ~ (1.1535D + 6.15)mm, the
Minor diameter = 0.985D ~ 0.998Dmm

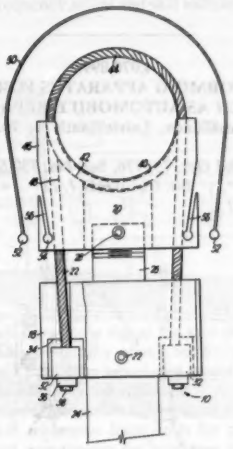
in which D is the distance between two points at which a straight line perpendicular to the roll gap center line and passing through a central point of the third stand groove intersects the upper and lower roll profile curves in the third stand.

4,070,894

CRIMPING DEVICE

Jackson A. Smith, 5443 Rand Road, Bradner, B. C., Canada

Filed Oct. 27, 1976, Ser. No. 736,352
Claims priority, application Canada, Aug. 6, 1976, 258609
Int. Cl.[2] B21D *37/00*
U.S. Cl. 72—292 3 Claims



1. A device for circumferentially crimping a tubular cable puller onto a free end of a cable, said criming device comprising

a base adapted for securement to the body of a fluid actuator;

a holder for said tubular puller and adapted for securement to the piston rod of said actuator whereby linear movement of the actuator piston relative to the body thereof effects relative movement between the base and the holder; and

a wire rope secured at each of its ends to said base and extending into and looping within the confines of said holder;

said holder having a semi-circular seat to accommodate a linear portion of the outside diameter of said tubular puller so as to retain it normal to said holder during a crimping operation and a groove in said seat to receive a portion of the loop of the wire rope;

the seat of said holder having a diameter equal to the outside diameter of the tubular puller;

said wire rope looping 360° around said tubular puller and circumferentially crimping the same in response to said base being drawn away from said holder by operation of said actuator.

4,070,895

METHOD FOR MANUFACTURING BOTTOM VALVE SEAT

Masami Yamada, Yokosuka, and Yuji Soeda, Odawara, both of Japan, assignors to Tokico Ltd., Kawasaki, Japan

Filed Sept. 10, 1976, Ser. No. 721,987
Claims priority, application Japan, Sept. 20, 1975, 50-113935; Sept. 20, 1975, 50-113936
Int. Cl.[2] B21D *53/10*
U.S. Cl. 72—334 7 Claims

1. A method for manufacturing a bottom valve seat for use in a hydraulic damper, in which projections defining fluid passages are provided on a lower end cover thereof, comprising the steps of:

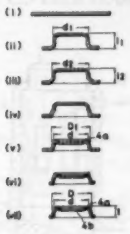
punching out a circular blank from a flat plate of a given thickness into a circular blank having given dimensions;

drawing said blank into a cup-shape having a circumferential flange portion;

forming a cylindrical wall for the cup-shaped work thus provided, said wall having a given length;

pressing the central portion of the bottom portion of said cup-shaped work downwards or internally, thereby forming an annular flat portion along the circumferential edge of said bottom portion;

cutting said flange portion to desired dimensions; and



after said forming and pressing steps, punching a through-hole in the bottom portion of said cup-shaped work;

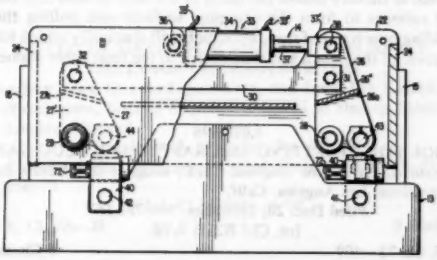
said flange portion being thereby formed to have a flat surface on the side opposite the bottom portion thereof, and said annular flat portion of said bottom portion being thereby formed to have a curvature along its inner circumferential edge for supporting a double-sheet valve.

4,070,896

PRESS BRAKE WITH IMPROVED RAM LEVELING ADJUSTMENT

Raymond J. Heitner, Greensboro, N.C., assignor to Wysong & Miles Company, Greensboro, N.C.

Filed Dec. 2, 1976, Ser. No. 746,799
Int. Cl.[2] B21D *7/06*
U.S. Cl. 72—389 7 Claims



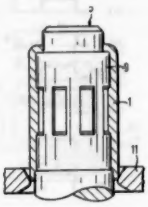
1. A press brake comprising an upstanding frame, a ram having opposite ends and hydraulic-mechanical power means for advancing and returning said ram, said power means including a pair of bell cranks each of which includes a fulcrum and first and second angularly related arms extending outwardly from said fulcrum and forming substantially a right angle therebetween, a pair of horizontally spaced pivot means for pivotally supporting said bell cranks about their fulcrums from said frame with said fulcrums at substantially the same level on said frame, hydraulic motor means connected between said frame and one of said bell cranks for oscillating said one bell crank about its fulcrum, link means pivotally interconnecting the first arm of said pair of bell cranks for causing parallel pivotal motion of said bell cranks, a pair of adjustable links pivotally supporting said ram from the second arm of said bell cranks, each link of said pair of adjustable links being independently adjustable in length for leveling said ram, and a pair of independently controlled reversible motor means for selectively lengthening and shortening each of said adjustable links.

4,070,897

METHOD FOR PRODUCING AN OUTER SHELL FOR OVERRUNNING CLUTCHES

Leonhard Linz, Herzogenaurach, Germany, assignor to Industriewerk Schaeffler OHG, Herzogenaurach, Germany

Filed Jan. 19, 1976, Ser. No. 650,292
Claims priority, application Germany, Feb. 4, 1975, 2504505
Int. Cl.[2] B21D 45/00
U.S. Cl. 72—345 2 Claims



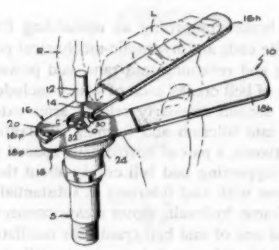
1. A method for producing an outer shell for an unitary overrunning roller clutch and roller bearing having a central section provided with camming or ramp surfaces about its circumference and on either side thereof s smooth cyclindrical end section as a race for cylindrical rollers with the diameter of the inner enveloping circle of the central section being less in the area of the camming surfaces than the diameter of the end sections comprising forming a shell of sheet metal, inserting into the shell a molding punch whose outer contour corresponds to the desired inner contour of the outer shell, stretching the shell to its final outer diameter with a die moving relative to the punch whereby the shell tightly grips the molding punch provided with a central section with recesses to form camming surfaces about its circumference and with a smooth cylindrical end section on either side of the central section whose diameters are the same and are greater than the diameter of the said inner enveloping circle of the central section to thereby enable the metal of the shell to flow into the said recesses to form the camming surfaces and pulling the molding punch out of the shell which will elastically widen for removal of the punch and then return to the final outer diameter.

4,070,898

TOOL FOR RESETTING AIRCRAFT SPARK PLUG GAP

Ronald A. Earle, Los Angeles, Calif., assignor to Aircraft Inspections, Los Angeles, Calif.

Filed Dec. 20, 1976, Ser. No. 752,163
Int. Cl.[2] B21D 9/08
U.S. Cl. 72—409 5 Claims



1. A tool for resetting the gap of an aircraft-type spark plug, comprising:

a pair of bars having pivot ends pivotally connected together and having opposite handle ends; and

a spark plug-holding member with a threaded hole, mounted on a first of said elongated members at a location spaced from the pivot end thereof by less than half the length of said first member;

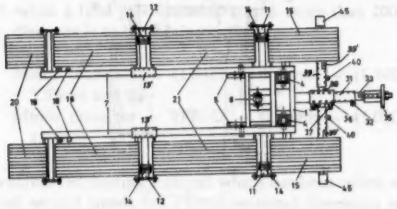
the second of said bars having a recess positioned so that when said bars are pivoted together, the recess on said second bar moves over the threaded hole of said spark plug-holding member, whereby a person can hold and operate the tool with one hand, with the spark plug held on the tool, while this other hand holds a spark gap gauge device.

4,070,899

METAL DEFORMING APPARATUS FOR PURPOSES SUCH AS AUTOMOBILE REPAIRS

Teuvo Olavi Veniällinen, Luistelijantie 9, 70200 Kuopio 20, Finland

Filed Oct. 7, 1976, Ser. No. 730,667
Int. Cl.[2] B21D 1/12
U.S. Cl. 72—457 16 Claims



1. In a metal deforming apparatus suitable for purposes such as automobile repairs, frame means, vertically movable support means operatively connected with said frame means for vertical movement with respect thereto, vertical moving means operatively connected with said vertically movable support means for moving the same vertically with respect to said frame means, gripping means carried by said vertically movable support means for gripping a structure such as the body of an automobile, for maintaining said structure stationary with respect to said vertically movable support means, so that by way of said vertical moving means, vertically movable support means, and gripping means it is possible to support a structure such as an automobile while placing it at a selected elevation with respect to said frame means, telescopic beam means carried by said frame means, having a horizontal axis, and capable of having its length changed, beam moving means operatively connected with said telescopic beam means for changing the length thereof, clamping means for clamping a structure such as a metal automobile part which is to be deformed or a tool for deforming a metal part, and positioning means carrying said clamping means and operatively connected with said beam means for situating said clamping means at a selected position with respect to said beam means, said beam moving means being operable to move said clamping means with respect to said support means for applying horizontal pushing or pulling forces to a part which is to be deformed while said vertical moving means is operable to move a structure with respect to clamping means for applying vertical pushing or pulling forces to a part which is to be deformed.

4,070,900

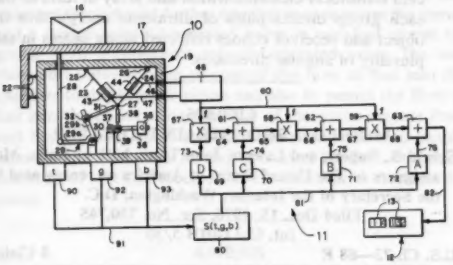
WEIGHING APPARATUS

Mathijs Maria Johannes Engels, Alphen Aan de Rijn, Netherlands, assignor to Maatschappij van Berkel's Patent N.V., Rotterdam, Netherlands

Filed Apr. 27, 1976, Ser. No. 680,961
Int. Cl.[2] G01G 3/16
U.S. Cl. 73—1 B 9 Claims

1. A weighing apparatus for measuring loads comprising, a weight receiving member, means for producing a vibrations signal which includes at least one differentially loaded vibrat-

ing string held under a predetermined tension, means connecting one end of the string to said weight receiving member, and means responsive to vibrations of said string for generating a frequency signal that is a function of the frequency of the vibrations of said string, said vibrations signal producing means being unadjustable and therefore incapable of compensating for any errors inherent therein, a digital indicator for indicating a digital weight measurement of a load on the weight receiving member, an evaluating device connected between the means generating said frequency signal and said indicator for converting said frequency signal to a signal for said digital indicator including a plurality of serially connected arithmetic components receiving said frequency signal, and means for calibrating the components and thereby the apparatus to produce accurate weight measurements, said calibrating means including a plurality of adjustable arithmetic logic units for producing constant inputs to said components for adjusting the relationship between calibrated weights and the frequency signals generated by said weights to calibrate the apparatus for obtaining the correct weight measurements at the digital indicator over a given range.



4,070,901

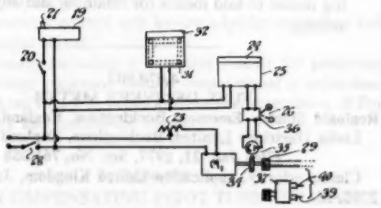
SPEEDOMETER AND RATIO TESTING APPARATUS

William J. McDonald, Bundoora, Australia, assignor to Gyro Enterprises (Rotates) Pty. Limited, Victoria, Australia

Filed June 22, 1976, Ser. No. 698,716

Int. Cl.[2] G01P *21/02*

U.S. Cl. 73—2 **10 Claims**



1. Apparatus for testing the accuracy of a vehicle instrument such as a speedometer, tachometer or the like having a rotary input shaft driven by te instrument drive meas of te vehicle, comprising

a. counter means **(25)** adapted for connection with the instrument drive means when the instrument is in a disconnected condition and the vehicle is driven through a preselected distace, thereby giving an indication of the travel of the vehicle over said preselected distance;

b. digital calculator means **(31)** for computing the actual number of turns of the instrument drive means per unit length of travel, expressed as a function of the speed of travel; and

c. variable speed drive means for driving the instrument drive means at a computed rotational rate corresponding to a preselected speed of travel for said vehicle, whereby the actual and expected readings for the said vehicle instrument can be compared and the accuracy of said instrument determined.

4,070,902

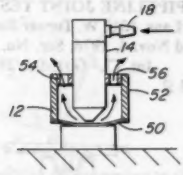
ATTACHMENT FOR AIR GAUGING APPARATUS

Max Knobel, 453 Beacon St., Boston, Mass. 02115

Filed Dec. 6, 1976, Ser. No. 747,804

Int. Cl.[2] G01B *13/06*

U.S. Cl. 73—37.5 **4 Claims**



1. An attachment for an air gauging apparatus having a nozzle having an orifice positioned in close proximity to the work being gauged and adapted to direct a flow of air through said orifice against said work to form a gap therewith, comprising

a. a flexible diaphragm, and,

b. means mounting said diaphragm to said nozzle and across said orifice,

c. said diaphragm normally closing said orifice under an idle condition of said nozzle and forming a gap therewith and in contact with said work when under a pressurized condition,

d. said mounting means including a tubular sleeve having an inside diameter greater than the outside diameter of said nozzle, said diaphragm being mounted across one end of said sleeve and a perforated annulus spaced from said one end mounted to said sleeve and adapted to engage said nozzle.

4,070,903

OUTFLOW METER FOR MEASURING SURFACE DRAINAGE CHARACTERISTICS

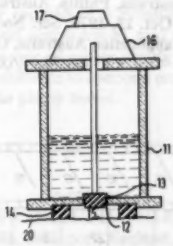
Geoffrey Lees, Stratford-upon-Avon, and Izzed-Din Katekhda, Birmingham, both of England, assignors to Dunlop Limited, London, England

Filed June 23, 1975, Ser. No. 589,572

Claims priority, application United Kingdom, July 25, 1974, 32956/74

Int. Cl.[2] G01N *15/08*

U.S. Cl. 73—38 **9 Claims**



1. An outflow meter for determining the drainage characteristics of a surface, in which the time for a given volume of fluid to flow out of the meter is a measure of the drainage characteristics of the surface, said meter comprising: a liquid fluid reservoir having an outlet in its base said reservoir including means for permitting measurement of outflow time of liquid from said

reservoir; a resilient disc having an elliptical surface engaging face for being selectively disposed in contact with a surface during use of the meter; an orifice extending through the disc and terminating at the surface engaging face; means for pressing the disc into engagement with a surface under a predetermined load; and closure means for the fluid reservoir outlet which closure means is removable from said outlet for bringing the outlet into fluid communication with the orifice to provide a fluid flow path from the reservoir through the orifice to the surface engaging face.

4,070,904

PIPELINE JOINT TESTER

Gerald G. VanderLans, 1310 W. Turner Road, Lodi, Calif. 95240

Filed Nov. 4, 1976, Ser. No. 738,839
Int. Cl.² G01M 3/28
U.S. Cl. 73—40.5 R **17 Claims**

14. A method for testing the ability of pipe joints to retain fluids under pressure comprising:

transporting through the pipeline an annular frame smaller than the interior of the pipeline, until said frame bridges a joint to be tested,

inflating with a liquid under pressure a spaced-apart pair of gasket assemblies that are rigidly retained by said frame, one on each side of said joint, each gasket assembly being axially within a different one of the two pipes, and thereby sealing off the exterior of said frame relative to both pipes,

introducing between said gasket assemblies and through said frame, into the annular space between said frame and said pipes, a fluid under a known pressure, and

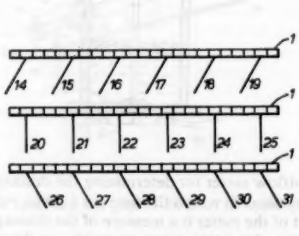
determining whether any leakage of said fluid occurs out from said space at known pressures of said fluid, said gasket assemblies being kept inflated at such pressure as retains the fluid against leakage between said frame and said pipes.

4,070,905

ULTRASONIC BEAM SCANNING

George Kossoff, Northbridge, Australia, assignor to The Commonwealth of Australia, Phillip, Australia

Filed Oct. 12, 1976, Ser. No. 731,697
Claims priority, application Australia, Oct. 13, 1975, 3548/75
Int. Cl.² G01N 29/00
U.S. Cl. 73—614 **6 Claims**



1. Apparatus for the ultrasonic examination of an object, comprising:

a linear transducer array for transmitting pulses of ultrasonic energy into the object and receiving echoes of the pulses reflected by acoustic impedance discontinuities within the object, said transducer array including a plurality of adjacent transducer elements;

means for energizing the elements of a group of said elements in a plurality of different sequences, each of said different sequences causing said group to cooperatively transmit a pulse of energy along a beam in a different one of a plurality of angular directions in a single plane; and

means for activating different non-exclusive groups of adjacent transducer elements within said array in turn, so that each group directs pules of ultrasonic energy into the object and receives echoes reflected along beams in said plurality of angular directions.

4,070,906

MODIFIED ROOF STRAIN INDICATOR

Gerald B. Rupert, and Lawson John Tyler, both of Rolla, Mo., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Dec. 15, 1976, Ser. No. 750,745
Int. Cl.² G01B 5/30
U.S. Cl. 73—88 E **8 Claims**

1. A horizontal roof strain indicator for use with two spaced mine roof bolts comprising:

a measuring cap assembly having an upper and lower section, means for vertically mounting said sections to each other so that the lower section can be rotatably adjusted in a horizontal plane, said upper section having roof bolt attachment means and said lower section having wire biasing and retaining means;

an anchor cap assembly spaced from said measuring cap assembly, said anchor cap assembly having roof bolt attachment means and means for retaining and adjustably tensioning a wire; and

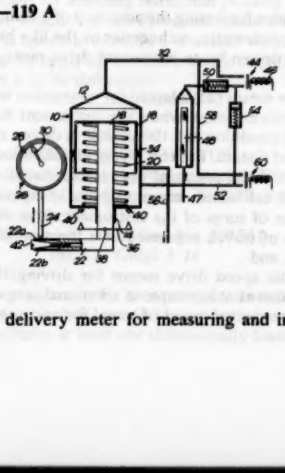
a tensioned wire extending from said wire biasing and retaining means to said means for retaining and adjustably tensioning.

4,070,907

FUEL DELIVERY METER

Reginald Stanley Emerson, Buckingham, England, assignor to Leslie Hartridge Limited, Buckingham, England

Filed Jan. 21, 1977, Ser. No. 761,058
Claims priority, application United Kingdom, Jan. 23, 1976, 2705/76
Int. Cl.² G01F 9/00
U.S. Cl. 73—119 A **4 Claims**



1. A fuel delivery meter for measuring and indicating the

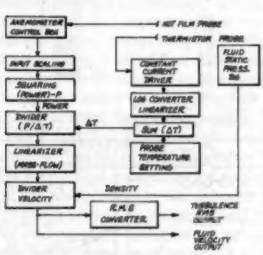
quantity of fuel delivered by engine fuel injection means "on test," the said meter comprising a chamber, a first opening in said chamber for receiving fuel delivered by engine fuel injection means, a spring-loaded piston within the chamber arranged to be displaced by fuel entering the chamber, indicating means operatively connected to the said piston so as to be actuated by displacement of said piston to give a reading which corresponds to the amount of fuel which has entered said chamber, at least one further opening in said chamber on that side of the piston remote from said first opening, a fuel circuit including fuel flow means for passing delivered fuel into said chamber through said further opening so as to warm the meter, and a simple solenoid-operated valve in said fuel circuit together with a three-port solenoid-operated valve, the said three-port valve serving to control the flow of fuel into the chamber to displace the piston and also to permit the flow of fuel into the chamber on that side of the piston remote from said first opening so as to warm the meter, and said simple solenoid-operated valve serving to control the flow, out of the chamber, of that fuel received by the chamber to displace the piston.

4,070,908

ANEMOMETER COMPENSATOR LINEARIZER

Stanley Ernest Newell, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sept. 28, 1976, Ser. No. 727,508
Int. Cl.² G01F *1/68*
U.S. Cl. 73—170 R **2 Claims**



2. In combination:

an anemometer control unit having a bridge excitation voltage output signal;

circuit means including a linearizer circuit for processing said bridge excitation voltage output signal in accordance with King's Law to provide signals representative of fluid velocity and turbulence intensity.

4,070,909

SPEED COMPENSATING PITOT TUBE APPARATUS

William R. Carpenter, Muskegon, Mich., assignor to Medallion Instruments, Inc., Spring Lake, Mich.

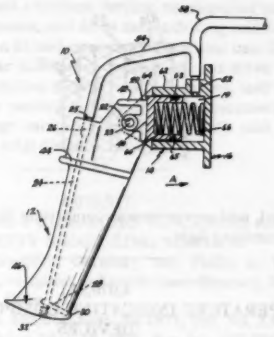
Filed Oct. 26, 1976, Ser. No. 735,744
Int. Cl.² G01C *21/10*
U.S. Cl. 73—182 **15 Claims**

1. A device usable with a water craft for exerting a variable force on a movable member, said member being mounted on said craft and being subjected to fluid drag forces exerted thereon during operation of said craft and which are proportional to craft speed, said forces tending to move said member, said device comprising:

an impact pressure tube having one end submerged and opening in the direction of craft travel;

a housing defining a pressure chamber, said impact pressure tube being connected to said pressure chamber, whereby the pressure within said chamber varies as a function of craft speed; and

force exerting means responsive to the pressure within said chamber for exerting a force on said member proportional



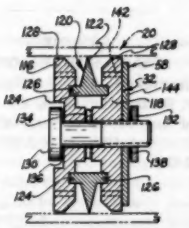
to the pressure within said chamber to thereby oppose the fluid drag forces exerted on said member.

4,070,910

FLUID FLOW MEASURING APPARATUS

William R. Alban, 6740 Africa, Galena, Ohio 43021

Continuation-in-part of Ser. No. 625,946, Oct. 28, 1975, Pat. No. 4,007,634. This application Aug. 23, 1976, Ser. No. 716,373
Int. Cl.² G01F *3/14*
U.S. Cl. 73—239 **14 Claims**



1. A fluid flow monitoring apparatus including a fluid metering cylinder; piston means mounted for reciprocation in said cylinder; and a low friction peripheral seal on said piston that functions as a bi-directional pressure relief means and that is normally flexed on one side of center during piston travel in one direction and shiftable to a pressure relief position on the other side of center responsive to pressure of said fluid flow upon arresting of said piston travel, said seal being normally flexed on said other side of center during piston travel in the other direction and shiftable to a second pressure relief position upon arresting of the piston travel.

4,070,911

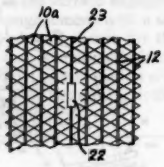
BRAIDED TAPE INCLUDING CARRIER MEANS

Ronay Denton Makin, Stockport, England, assignor to Thomas French and Sons (Electrical) Limited, England

Filed July 7, 1975, Ser. No. 593,375
Claims priority, application United Kingdom, July 5, 1974, 29832/74
Int. Cl.² G01K *1/00*
U.S. Cl. 73—343 R **6 Claims**

1. A tape comprising a single thickness braid of flat construc-

tion formed of yarns and carrier means for transmission of energy contained between the yarns from which the braid is



produced, said carrier means comprising fibre optics material for transmitting light.

4,070,912

TEMPERATURE INDICATING COMPOSITIONS AND DEVICES

Thomas J. McNaughtan, deceased, late of Malvern, Pa., and by Jerry McClintock, executor, R.R. 2, Box 183C, Fortville, Ind. 46040

Filed Oct. 1, 1975, Ser. No. 618,592
Int. Cl.[2] C09K *3/34*; G01K *11/16*; C09D *11/10*
U.S. Cl. 73—356 **6 Claims**

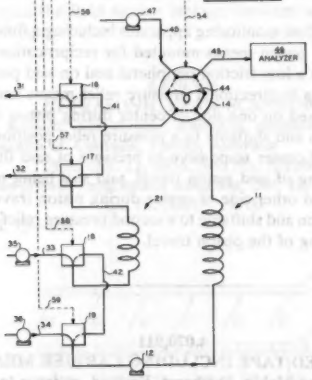
3. A temperature indicating device comprising temperature sensitive materials applied to a substrate to form a plurality of markings thereon, each marking having a different temperature sensitivity, said temperature sensitive materials being formed by heating cholesteryl acetate with a thermoplastic ester of dimeric resin acid and pentaerythritol in the presence of varying amounts of cholesteryl propionate at a temperature of 150° C until no further acetic acid is formed and the oily liquid changes to a solid.

4,070,913

SAMPLE DILUTION

Lewis B. Roof, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 31, 1976, Ser. No. 719,217
Int. Cl.[2] G01N *1/10*
U.S. Cl. 73—422 GC **15 Claims**



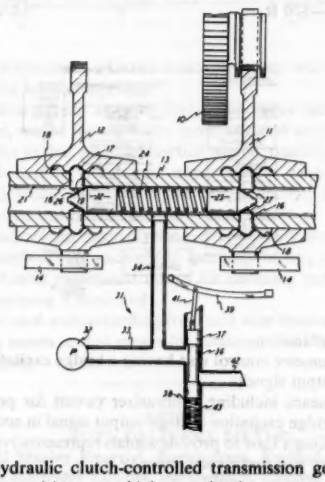
1. Apparatus comprising:
first conduit means having a passageway therethrough with a first internal volume;
second conduit means having a passageway therethrough with a second internal volume, said second internal volume having a predetermined size relationship to said first volume;
means for filling said passageway of said first conduit means with a diluent liquid;
means for filling said passageway of said second conduit means with a sample material;
means for connecting said passageway of said first conduit means and said passageway of said second conduit means to form a closed conduit loop; and
means for circulating said diluent liquid and sample material through said conduit loop to cause mixing thereof.

4,070,914

HYDRAULIC CLUTCH-CONTROLLED TRANSMISSION GEAR DETENT SYSTEM

Jack Reinhardt; Kenneth Albert Moehle, and Jerald Dietrich Hinke, all of Racine, Wis.

Filed Sept. 17, 1976, Ser. No. 724,337
Int. Cl.[2] G05G *9/00*
U.S. Cl. 74—475 **8 Claims**

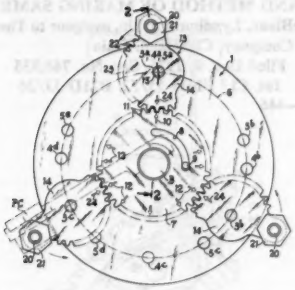


1. A hydraulic clutch-controlled transmission gear detent system comprising a vehicle, a clutch actuator movably mounted on said vehicle, a transmission shift rail, a shift member slidably mounted on said shift rail for sliding therealong, a connector connected with said shift member for sliding said shift member along said rail, a detent member operatively disposed intermediate said shift rail and said shift member for releasably securing said shift member in position along said shift rail, a hydraulically movable member operatively associated with said detent member for moving said detent member, a gear operatively connected with said shift member for shifting and positioning with respect to the position of said shift member, a hydraulic system operatively associated with said movable member for moving said movable member and thereby move said detent member into operative position relative to said shift rail and said shift member, said hydraulic system including a hydraulic valve for releasing hydraulic pressure in said hydraulic system, and said clutch actuator being connected with said valve for actuating said valve for releasing the hydraulic pressure and thereby releasing said detent member relative to said shift member and said shift rail.

4,070,915
DEVICE FOR FIXING VEHICLE WHEELS ON A WHEEL-BALANCING MACHINE

Yves Robert Caroff, Saint Mande, France, assignor to Facom, Villeneuve le roi, France

Filed Oct. 28, 1976, Ser. No. 736,488
Claims priority, application France, Dec. 4, 1975, 75 37097
Int. Cl.[2] G01M *1/02*
U.S. Cl. 73—487 28 Claims

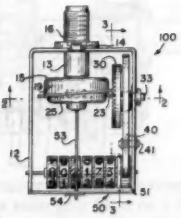


1. A device for fixing vehicle wheels having fixing apertures on a balancing machine provided with a rotary shaft, comprising in combination: a platen provided in the centre thereof with means for fixing same on said shaft to rotate about the axis thereof and a series of passages respectively having axes parallel to said shaft axis and located repsectively at the apices of at least three regular polygons, comprising respectively a triangle, a square and a pentagon, a set of first means each of which first means comprises a journal adapted to be engaged in one of the passages of the platen and a fixing stud which is eccentric with respect to said journal, and drive means for simultaneously driving all of said first means so as to rotate, by the rotation of one of the first means, all the other first means, whereby the studs of the first means are located at a distance from the centre of the platen equal to the distance between the fixing apertures of the wheel to be balanced and the centre of said wheel, one of said passages constituting an apex common to all the polygons and said passages being all located on the same circumference of the platen.

4,070,916
SPEEDOMETER-ODOMETER APPARATUS

Donald Bogosh, 2646 Willow St., Franklin Park, Ill. 60131

Filed Nov. 15, 1976, Ser. No. 741,734
Int. Cl.[2] G01C *22/00, 23/00*
U.S. Cl. 73—490 7 Claims

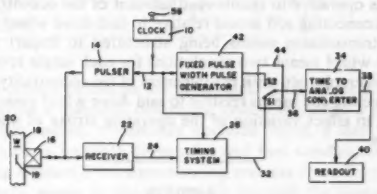


1. An apparatus particularly for use in a speedometer and odometer drive assembly, said apparatus including a drive means, a face gear mounted for rotation and operatively connected to said drive means, a camming means mounted on said face gear for eccentric rotation, a drive arm, said drive arm being pivotal about a central portion thereof, a cam follower including an opening in said drive arm, said opening captivating said camming means to cause a following movement of said camming means, at least one angularly disposed extension on said drive arm, said extension having an engaging means to engage a display means, said drive means driving said face gear to impart a rotation to said camming means, said cam follower causing an angular oscillatory motion in said drive arm in response to the rotation of said camming means, said angular oscillatory motion causing said drive arm to successively engage and disengage said engaging means with said display means to indicate total distance traveled.

4,070,917
ULTRASONIC PULSE-ECHO THICKNESS AND VELOCITY MEASURING METHOD

Ludwig Niklas, Lovenich, Germany, and Philip A. Walker, Trumbull, Conn., assignors to Krautkramer-Branson, Incorporated, Stratford, Conn.

Division of Ser. No. 618,074, Sept. 30, 1975, Pat. No. 3,994,154. This application May 19, 1976, Ser. No. 687,896
The portion of the term of this patent subsequent to Nov. 30, 1993, has been disclaimed.
Int. Cl.[2] G01N *29/00*
U.S. Cl. 73—598 9 Claims



1. The method of measuring characteristics of a workpiece by the pulse-echo ultrasonic technique comprising the steps of:
producing timing pulses from a clock;
providing a pulse signal commensurate with a predetermined time interval;
periodically transmitting an ultrasonic search signal into the workpiece responsive to said timing pulses and receiving a corresponding echo signal arising from the search signal intercepting an acoustic discontinuity in the workpiece;
providing a timing signal commensurate with the time interval between said search signal entering the workpiece and the receipt of said echo signal;
coupling said pulse signal and said timing signal sequentially to a converting means, and
providing respective output signals from said converting means responsive to said sequentially coupled signals, said output signals being commensurate with workpiece characteristics.

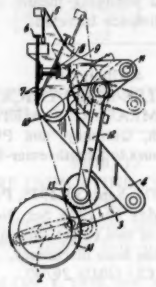
4,070,918
GRIPPER HOLDER BANDS DRIVING MECHANISM FOR SHUTTLELESS LOOMS

Cayetano Nunez Fuentes, Sabadell, Spain, assignor to Ingeniera Aplicada, S.A. (INAPSA), Badalona, Spain

Filed June 5, 1975, Ser. No. 583,973
Claims priority, application Spain, June 6, 1974, 203730
Int. Cl.[2] F16H *21/40*
U.S. Cl. 74—70 3 Claims

1. A shuttleless loom having means forming a shed of warp threads including a sley mounted for reciprocal movement, weft insertion means including a pair of lance bands reciprocal toward and away from each other through said shed and a driving mechanism for synchronously driving said sley and said lance bands, said driving mechanism comprising a driving crankshaft, crank means driven by said crankshaft for imparting reciprocal movement to said sley, gear train means including sector gear means pivotally mounted upon said sley for

reciprocally driving said lance bands, transmission means including drive wheel means for transmitting power from said crankshaft to said sector gear means, connecting rod means operatively interconnected between said drive wheel means and said sector gear means for effecting reciprocal pivotal motion of said sector gear means and adjustment eccentrically mounting said connecting rod means upon said drive wheel



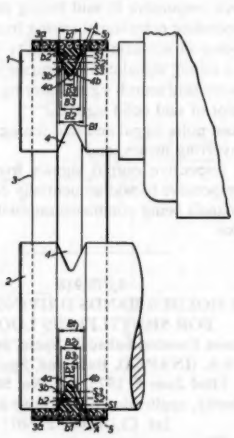
means operative to enable readjustment of the eccentricity of said connecting rod means relative to said drive wheel means, said transmission means being structured to impart to said drive wheel means two revolutions for each single revolution of said crankshaft, with readjustment of the eccentricity of said connecting rod means relative to said drive wheel means operating to effect variation of the operating stroke of said lance bands.

4,070,919

BELT DRIVE SYSTEM

Arnulf Ummen, and Alexander Muller, both of Hoxter, Germany, assignors to Arntz-Optibelt-KG, Hoxter, Germany

Filed May 17, 1976, Ser. No. 687,173
Claims priority, application Germany, May 17, 1975, 2522183
Int. Cl.[2] F16G *5/20*
U.S. Cl. 74—229 **2 Claims**



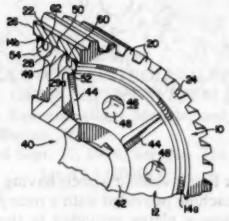
1. In a belt drive system, a rotating driving element having an annular groove, a rotating driven element having an annular groove, and a drive belt extending between the driving and driven elements to transmit a driving force from the driving element to the driven element, said belt comprising a flat belt part, a helically wound tension element, and a rib engaged in the annular grooves, the rib having a width measured in several planes parallel to the flat belt part which is smaller by a constant distance than the width of the grooves when measured in said planes, whereby during operation of the system, one side of the rib engages an adjacent side of the grooves and the other side of the rib is spaced from the adjacent side of the grooves by the same distance at the level of each of said planes.

4,070,920

COMPOSITE GEAR HAVING CARBURIZED TEETH AND METHOD OF MAKING SAME

Wayne J. LeBlanc, Lyndhurst, Ohio, assignor to The Horsburgh and Scott Company, Cleveland, Ohio

Filed Dec. 9, 1976, Ser. No. 748,935
Int. Cl.[2] F16H *55/12*; B21D *53/26*
U.S. Cl. 74—446 **22 Claims**



1. A composite gear comprising:

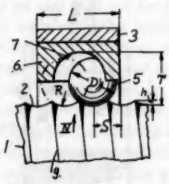
a circular gear ring having an inner surface and an outer surface having a plurality of gear teeth; and, a circular gear hub having a pair of axially facing sides and an outer surface, at least midportions of said hub outer surface being in substantial pressure abutment with midportions of said ring inner surface creating a central abutment area, and a pair of cylindrically extending weld beads between said ring inner and hub outer surfaces each axially spaced from axially opposite edges of said abutment area, said weld beads and the adjacent portions of said ring and hub being at least in radial tension.

4,070,921

SCREW SPINDLE

Franz Arnold, Spatzenweg 20, 8960 Kempton, Germany

Filed Oct. 21, 1976, Ser. No. 734,645
Claims priority, application Germany, Oct. 28, 1975, 7534177[U]; Oct. 28, 1975, 7534145[U]
Int. Cl.[2] F16H *25/22, 1/18*
U.S. Cl. 74—459 **11 Claims**



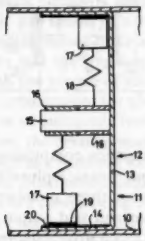
1. In a screw spindle drive comprising a screw spindle having at least one thread groove of circular cross section, a nut having a thread groove complementary to said thread groove on said screw spindle to form a ball raceway therebetween, and a closed ring of equal diameter balls in said ball raceway, the improvement comprising wherein the pitch of said thread groove on said screw spindle is less than the diameter of each of said balls.

4,070,922

ROTOR BALANCING DEVICES

Howard John Wyman, Kenilworth, England, assignor to Chrysler United Kingdom Limited, London, England

Filed Sept. 29, 1976, Ser. No. 727,657
Claims priority, application United Kingdom, Oct. 7, 1975, 41064/75
Int. Cl.[2] F16F *15/22;* F16C *1/00, 3/00*
U.S. Cl. 74—573 R 11 Claims



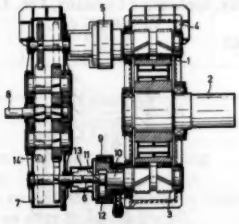
1. A rotor balancing device comprising a housing for mounting in a hollow shaft to be balanced, the housing being cup shaped and having a base wall formed with a cylindrical wall around the periphery thereof and having a pivot mounted at the center of the base concentrically with the peripheral wall, two bushes rotatably mounted on the pivot, two weights located within the housing, means connecting the two weights respectively to the two bushes to restrain the weights from engaging the peripheral wall of the housing until the rotor is rotated at a balancing speed at which the weights move around the pivot to counter-balance any out of balance in the rotor and adhesive means selectively disposed on at least one of the cylindrical walls of the housing and the weights to secure the weights in said balancing positions.

4,070,923

MULTIPLE PINION CONCENTRIC DRIVE

Heinrich Benthake, Mulheim (Ruhr), Germany, assignor to WGW Westdeutsche Getriebe und Kupplungswerke GmbH, Bochum, Germany

Filed Mar. 29, 1976, Ser. No. 671,114
Claims priority, application Germany, Oct. 27, 1975, 2547944
Int. Cl.[2] F16H *37/06, 57/10*
U.S. Cl. 74—665 P 10 Claims



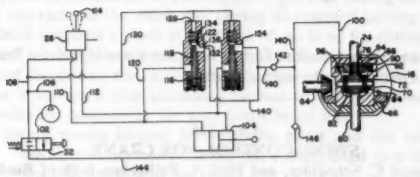
1. Multiple pinion concentric drive having a plurality of pinions meshing with a main gear fixed on a driven shaft, the main gear having a diameter larger than that of the pinions, comprising a respective rotatable gearing unit preceding and connected to the pinions for driving said pinions, the rotatable gearing units being connected to and driven by a distributor gearing, said rotatable gearing units having a respective outer concentric gear rotatably mounted thereon, and an elastic member for each of said rotatable gearing units respectively connected to said outer concentric gear so that the reaction moment of said outer concentric gear acts against said elastic member, and is damped by said elastic member whereby a uniform turning moment distribution is effected.

4,070,924

AUTOMATIC CONTROL OF LOCKABLE DIFFERENTIALS

Emil F. Moreno, Melrose Park; Ralph S. Hajek, Villa Park, and Julius F. Marquardt, Westchester, all of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed May 21, 1976, Ser. No. 688,646
Int. Cl.[2] F16H *1/44;* A01B *63/10*
U.S. Cl. 74—710.5 7 Claims



1. In a control circuit for use in controlling a lockable differential having a manually controlled system including a pressure supply means, a manually operated valve, a one way check valve, a lockable differential and first conduit means providing a means for communicating pressure from the pressure supply means to the differential through the manually operated valve and the one way check valve, the improvement comprising an automatically engaged differential locking system comprising:

a peripheral equipment control lever;

a multi position normally closed control valve being operatively linked to the peripheral equipment control lever;

a second one way check valve permitting flow in one direction;

second conduit means allowing communication between the pressure supply means and the lockable differential through the multiposition normally closed control valve and the second one way check valve whereby displacement of the peripheral equipment control lever will result in the opening of the multiposition normally closed control valve thus resulting in transmission of pressure from the pressure supply means to lock the lockable differential.

4,070,925

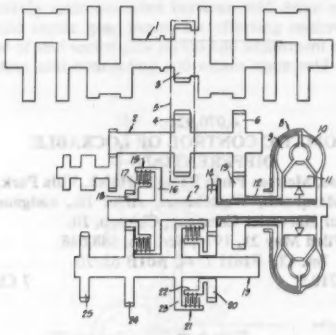
POWER TRANSMISSION FOR MOTORCYCLES

Kazuyoshi Yoshida, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 8, 1976, Ser. No. 748,659
Int. Cl.[2] F16H *47/00*
U.S. Cl. 74—720 2 Claims

1. A power transmission assembly for a motorcycle engine having a crank shaft, the power transmission assembly including an idler shaft driven from the crank shaft, an input shaft, and an output shaft, the shafts all being parallel, a torque converter mounted on the input shaft, means for driving the torque converter from the idler shaft, first means for driving the output shaft from the input shaft including a clutch mounted on the output shaft, second means for driving the output shaft

from the input shaft including a clutch mounted on the input shaft, the torque converter overlapping the ends of the idler



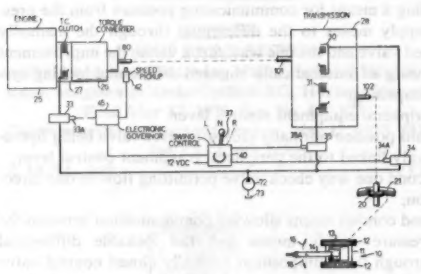
shaft and output shaft to form a compact assembly, and a final drive element on the output shaft.

4,070,926

SWING CONTROL FOR CRANE

Raymond C. Schneider, and Paul A. Pelligrino, both of Rockford, Ill., assignors to Twin Disc, Incorporated, Racine, Wis.

Filed Dec. 22, 1975, Ser. No. 643,357
Int. Cl.² F16H *47/00*
U.S. Cl. 74—730 **8 Claims**



1. In a power transmission system:

a torque converter;

a modulatable torque converter clutch in said torque converter modulatable between a minimum engaged condition and a fully engaged condition;

a transmission connected to be driven by said torque converter;

at least one modulatable transmission clutch in said transmission modulatable between a minimum engaged condition and a fully engaged condition;

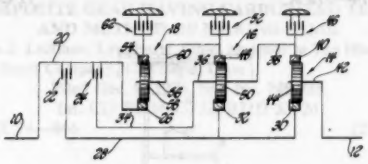
selectively operable control means for operating said clutches, said control means comprising an operator-controllable control member movable between a neutral position and at least one other position through an intermediate position therebetween, to enable selective modulation of said transmission clutch between minimum and fully engaged conditions as said control member is moved between said neutral position and said intermediate position, said control means further comprising means responsive to placement of said control member in said intermediate position whereby said transmission clutch is placed in fully engaged condition and to enable further movement of said control member between said intermediate position and said one other position to effect modulation of said torque converter clutch between partially engaged and fully engaged condition.

4,070,927

PLANETARY GEARING ARRANGEMENT FOR A TRANSMISSION

James C. Polak, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed June 4, 1976, Ser. No. 692,970
Int. Cl.² F16H *57/10*
U.S. Cl. 74—765 **3 Claims**



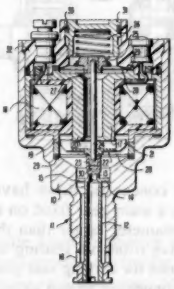
1. A planetary transmission comprising; a transmission housing; input means; output means; a plurality of simple planetary gear means each having three members interconnected between said input means and said output means; a plurality of selectively operable friction drive establishing means including at least two clutch means for providing selective drive paths from said input means to said planetary gear means and said friction drive establishing means being further connected with said planetary gear means for establishing a plurality of forward drive ratios and a reverse drive ratio between said input means and said output means, the number of said forward drive ratios being one greater than the number of friction drive establishing means and said friction drive establishing means being interchanged during shifting from one ratio to the next higher or lower ratio with only a single transition interchange between said friction drive establishing means; and one of said planetary gear means (**18**) having the first member (sun gear **26**, FIG. **1**, ring gear **54**, FIG. **3**) thereof continuously connected to one of said transmission housing and said input means and the second member (ring gear **54**, FIG. **1**, sun gear **26**, FIG. **3**) of said one planetary gear means being selectively connectable with the other of said transmission housing and said input means through one of said friction drive establishing means (brake **62**, FIG. **1**, clutch **76**, FIG. **3**).

4,070,928

CONTROL VALVE FOR THE WORKING PRESSURE OF AN AUTOMATIC CHANGE-SPEED GEAR

Arwed von Koch, Stuttgart, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Feb. 12, 1973, Ser. No. 332,005
Claims priority, application Germany, Feb. 12, 1972, 2206751
Int. Cl.² B60K *41/18*
U.S. Cl. 74—863 **28 Claims**



1. A control valve arrangement for controlling the pressure of a pressure medium in an automatic transmission for vehicles having a driving engine, the arrangement comprising: control

valve means constructed as a solenoid valve means including a ring-shaped armature means, a valve closure body means, said ring-shaped armature means being operatively connected with said valve closure body means and applying a predetermined force on said valve closure body means in a de-energized condition of the solenoid valve means a constant width annular magnetic gap means for accommodating said ring-shaped armature means upon an energization of the solenoid valve means, and means for energizing said solenoid valve means in dependence upon the torque of the driving engine such that said ring-shaped armature means is drawn into said constant width annular magnetic gap means by a predetermined amount so as to change the predetermined force acting upon said valve closure body means to that the pressure of the pressure medium is correlated with the torque of the driving engine.

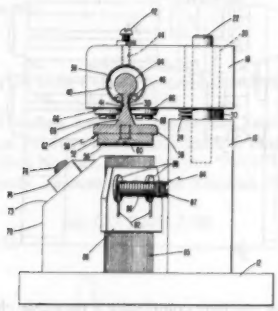
20. A control valve arrangement for controlling the pressure of a pressure medium in an automatic transmission for vehicles having a driving engine, the arrangement comprising: control valve means constructed as a solenoid valve means including a coil carrier body means, an armature means and a valve closure body means, said armature means being operatively connected with said valve closure body means and applying a predetermined force on said valve closure body means in a deenergized condition of the solenoid valve means, means for changing said predetermined force upon an energization of said solenoid valve means in dependence upon the torque of the driving engine, a rod extends centrally through the coil carrier body means, said armature means being fixedly mounted at one end of said rod, and a spring and abutment means for said spring are provided, said abutment means being disposed on an opposite end of said rod.

4,070,929

TOOL SHARPENING APPARATUS

Francis E. Risher, 906–25th St., Canton, Ohio 44709

Filed June 21, 1976, Ser. No. 697,719
Int. Cl.² B21K *5/12*
U.S. Cl. 76—82 **10 Claims**



1. Tool sharpening apparatus, comprising:

a base member;

support means on said base member for securely holding a tool having an edge to be sharpened;

a head member reciprocably carried on said base member for movement toward and away from the edge of a tool held by said support means;

a sharpening element slightly mounted on said head member for reciprocable motion in constant planes relative to and generally longitudinally along the tool edge; and

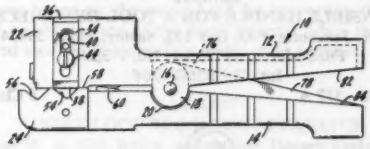
means biasing said head member away from the tool edge, whereby said head member is movable downwardly for engagement of the sharpening element with the tool edge on a forward stroke thereof and is urged upwardly to separate the sharpening element from the tool edge on a return stroke.

4,070,930

WIRE STRIPPER

John A. E. Oprins, Sycamore, Ill., assignor to Ideal Industries Inc., Sycamore, Ill.

Filed Sept. 3, 1976, Ser. No. 720,202
Int. Cl.² H02G *1/12*
U.S. Cl. 81—9.5 B **8 Claims**



1. In a wire stripper tool having a pair of arms connected at a pivot intermediate the ends thereof, one arm having an anvil at one end and the other arm having an opposed cutting head which supports a blade at the front of the head for slitting the wire insulation longitudinally, and a blade at each side of the head for slitting the insulation circumferentially, and wherein the anvil has a seat extending normal to the second-named blades for positioning the wire while being slit:

spring means located between the pivot and the cutting blades and normally biasing the cutting head to a closed position relative to the anvil;

said arms having opposed inner surfaces which are divergent rearward of said pivot to enable the arms to be squeezed together rearward of the pivot thereby to move the cutting head to an open position relative to the anvil which allows a wire to be positioned in the seat for slitting; and

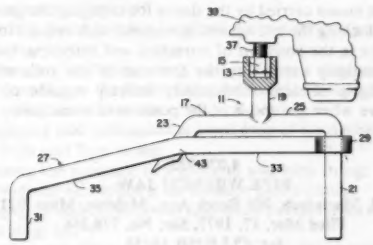
said inner surface of one arm being slotted and the inner surface of the arm opposed thereto having a guide rib with one end disposed in both the slot in the open and closed position of the cutting head.

4,070,931

LUG WRENCH

Nicholas Florko, Jr., 161 Marine Drive Apartment 6D, Buffalo, N.Y. 14202

Filed Sept. 7, 1976, Ser. No. 720,815
Int. Cl.² B25B *13/00*
U.S. Cl. 81—177 B **10 Claims**



1. A lug wrench which comprises a socket for gripping a lug nut or lug head, turning means held to said socket for turning it, said turning means having two parts, first and second parts, extending at least partially opposite to the direction of the lug when the lug wrench is in operative position, and offset with respect to it, the first part extending parallel with and opposed to the direction of the lug, and lever means connectable to the first part of the turning means in pivotal relationship, rotatable with respect to said first part of the turning means and bearable against the second part thereof, against which it applies a force so as to make a lever with a fulcrum where it is pivotally connected with the first part of the turning means and a point of application of force where it bears against the second part

thereof, so that on applying a turning force to an end of such lever away from the fulcrum, the socket, when gripping a lug nut or lug head, applies a balanced turning force to said lug nut or lug head, thus facilitating ready release of a lug nut or a lug without the socket slipping off said lug nut or lug because of application of unbalanced forces thereto.

4,070,932

EXTENSIBLE HANDLE FOR A TOOL HEADPIECE

Richard W. Jeannotte, P.O. Box 132, Shelby, Mont. 59474

Filed Mar. 1, 1977, Ser. No. 773,219
Int. Cl.² B25G *1/04*
U.S. Cl. 81—177 A **5 Claims**

1. An extensible tool handle for applying different degrees of torque to a tool headpiece, which handle comprises, in combination:

a. a sleeve for supporting the tool headpiece at one end of the sleeve,

b. a rod telescopically received within the other end of the sleeve and having at least one I-shaped groove along the surface thereof for permitting the rod to assume at least one position of retraction and at least one position of extension with respect to the sleeve,

c. resilient means disposed within the sleeve for biasing the rod towards the position of extension,

d. latch means carried by the sleeve for engaging the groove and locking the rod against movement with respect to the sleeve in the positions of retraction and extension, and

e. a handgrip carried by the free end of the rod, which handgrip remains substantially entirely outside of the sleeve when the rod is in the position of retraction.

4,070,933

PIPE WRENCH JAW

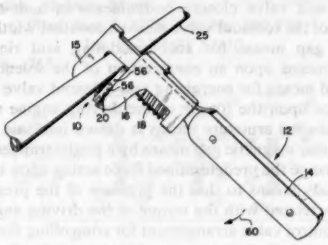
Robert B. Macintosh, 206 Beech Ave., Melrose, Mass. 02176

Filed Mar. 17, 1977, Ser. No. 778,356
Int. Cl.² B25B *13/58*
U.S. Cl. 81—180 B **10 Claims**

1. A pipe wrench jaw adapted to be utilized with a wrench having a pair of jaw members adapted to be moved towards and away from each other, said jaw comprising:

a. a housing member having an upper and lower end spaced from each other and a pair of sides adapted to fit across the width of a jaw member with a plurality of grooves extending on said upper end between said sides, each said groove having a front and rear wall extending in spaced relationship to each other, and

b. a gripping member pivotably mounted in each said groove between said sides and adapted for angular movement between a forward position and a rearward position between said front and rear wall respectively, each said gripping member including a plurality of transversely extending teeth formed in an arcuate path having a front end and a rear end, said front end having a greater radius than said rear end so as to obtain a gripping engagement



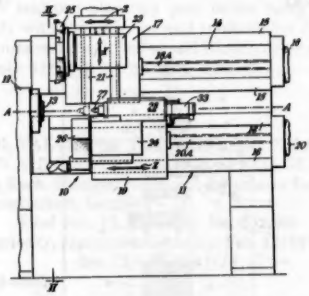
with a pipe or the like contained therebetween with said gripping member adapted to rotate with the movement of the wrench.

4,070,934

MACHINE TOOLS

Stuart Rodney Sladdin, Newcastle on Tyne, and Malcolm Thorneycroft, Whitley Bay, Tyne and Wear, both of England, assignors to Charles Churchill Limited, England

Filed May 18, 1976, Ser. No. 687,598
Int. Cl.² B23B *7/04, 3/00*
U.S. Cl. 82—2 R **4 Claims**



1. A turning machine comprising a rotatable chuck for supporting a workpiece to be machined, two simultaneously and independently operable turrets for carrying tools for machining the workpiece, one of said turrets having a free tool station devoid of tools and each turret being supported by a toolslide with respect to which it can be indexed about an axis parallel to the rotational axis of the chuck, said axes being on opposite sides of said rotational axis, both toolslides being movable along slideways parallel to said rotational axis and one at least of said toolslides also being movable along a slideway perpendicular to said rotational axis, a ram mounted on the toolslide carrying said one turret at the side of said one turret remote from the chuck, said ram being movable with respect to said toolslide in a direction towards and away from the chuck, and a support member rotatably mounted on the ram, said support member being movable by said ram past said station devoid of tools to support the end of the workpiece remote from the chuck.

4,070,935

CHUCKING DEVICE FOR A MACHINE TOOL

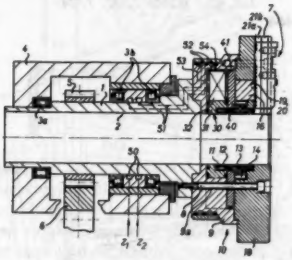
Bruno Caprioli, Basano del Grappa, Italy, assignor to Forkardt, Gefitec, Zug, Switzerland

Filed Jan. 7, 1977, Ser. No. 757,653

Claims priority, application Switzerland, Apr. 9, 1976, 4570/76

Int. Cl.[2] B23B *31/30*

U.S. Cl. 82—40 R 8 Claims



1. In a chucking device, especially for a turning machine, having a chuck body and jaws guided for radial movement on one side of the chuck body; a bar longitudinally moveable in the chuck body transversely to the direction of movement of each jaw and each jaw and bar having meshing teeth which effect radial movement of the jaw in response to movement of the bar in the chuck body, a gear on the axis of the chuck in the plane of said bars and to which each bar is tangential, each bar having gear teeth on the side facing the gear and engaging the teeth on the gear, a rotary piston directly coupled to said gear and having radial wings thereon, cavity means in the chuck body having discrete chambers each having a said wing therein, and means for supplying actuating fluid to said chambers on one side of said wings to move said jaws radially inwardly and on the other side of said wings to move said jaws radially outwardly.

4,070,936

APPARATUS FOR CUTTING OR SCORING SHEET MATERIAL

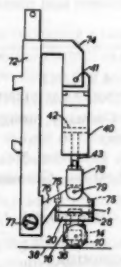
Angus Dougal Duncan, Ashton-in-Makerfield, England, assignor to Pilkington Brothers Limited, St. Helens, England

Filed Nov. 29, 1976, Ser. No. 745,677

Claims priority, application United Kingdom, Dec. 5, 1975, 50043/75

Int. Cl.[2] B26D *3/08*

U.S. Cl. 83—12 12 Claims



1. Apparatus for cutting or scoring sheet material comprising a cutter head mounted for travel toward and away from a surface of the sheet material, a cutting or scoring tool supported and guided in the cutter head for movement relative to the cutter head towards and away from the surface of the sheet material, loading means connected to the cutter head for applying a cutting or scoring load thereto, a fluid pressure actuated diaphragm located within the cutter head and operatively connected to the tool, fluid pressure supply means arranged to selectively control the fluid pressure acting on each side of the diaphragm at any time during operation so that the diaphragm can be displaced to move the tool relative to the cutter head toward and away from the surface of the sheet without varying the load applied by the loading means to the cutter head, and support means on the cutter head for supporting the cutter head on the surface of the sheet material when the tool is moved away from the surface of the sheet material.

4,070,937

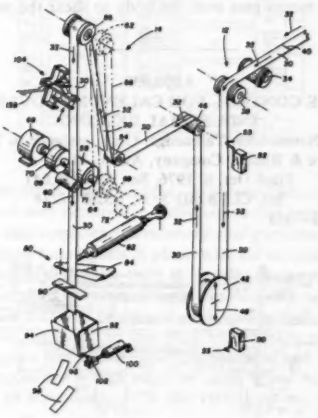
BELT LOOP TRIMMING APPARATUS

Joseph W. A. Off, Irving, and Judson Horace Early, Dallas, both of Tex., assignors to Haggar Company, Dallas, Tex.

Division of Ser. No. 559,340, March 17, 1975, Pat. No. 4,026,172. This application Feb. 9, 1977, Ser. No. 767,079

Int. Cl.[2] B26D *7/06*

U.S. Cl. 83—27 3 Claims



1. In the method of making belt loops from an elongated loop string having splices along the length thereof, the improvement comprising:

feeding the loop string lengthwise into a metering and trimming portion;

advancing said loop string past a cutter a distance corresponding to the desired length of said belt loop;

stopping the movement of said loop string;

engaging said cutting to cut a belt loop of the desired length from said loop string;

sensing the presence of a splice in said loop string;

advancing said splice a set distance past a cutter;

engaging said cutter to cut said splice portion from said loop string; and

sorting said splice portion from said belt loop lengths.

4,070,938

AUTOMATIC SHEARING DEVICE

Lancelot H. Lines, Adelaide, Australia, assignor to Senil Nominees Pty. Ltd.; The Commonwealth of Australia and Australian Merino Wool Harvesting Limited, all of, Australia

Filed July 27, 1976, Ser. No. 709,168

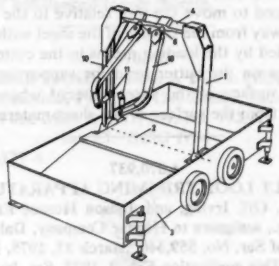
Claims priority, application Australia, July 29, 1975, 2548/75; Dec. 19, 1975, 4351/75; Apr. 1, 1976, 5452/76

Int. Cl.[2] B26B *19/24*

U.S. Cl. 83—71 7 Claims

1. A shearing device including means to support an immobilized sheep, a linkage system including a frame pivoted about an axis transverse to the sheep, a beam pivoted to the frame

parallel to the transverse axis, and a pair of caliper arms pivoted to the beam by a connection allowing pivoting about two axes at right angles to each other and generally at right angles



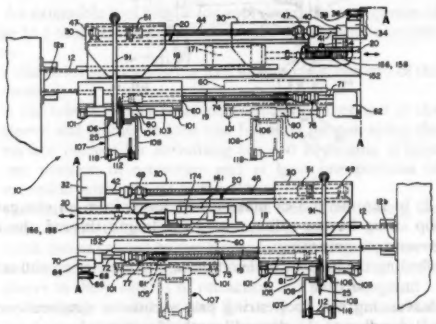
to the said axis of said beam, cutter means on each caliper, and means to control the movement of the linkage system whereby the cutter means pass over the body to shear the wool therefrom.

4,070,939

EDGE CONTROL FOR CALENDER COVERING INDUSTRIAL BELTING

Alvin W. Neumeister, Tallmadge, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Oct. 6, 1976, Ser. No. 730,041
Int. Cl.² B26D *5/34;* B32B *31/18*
U.S. Cl. 83—368 **7 Claims**



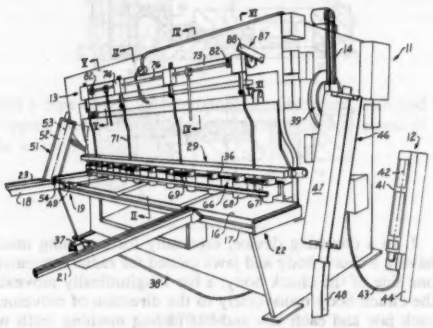
1. In an industrial belting calender having a plurality of rolls and spaced apart side frames, a hydromechanical belt edge trimming device comprising a main support beam fixed on and extending between said side frames and extending parallel to one of said rolls, a main carriage mounted on the main beam for movement longitudinally thereof, a first allochiral pair of carriages supported on and movable longitudinally of the beam, first drive means fixed on the beam and connected to move the first pair of carriages toward and away from each other, a second allochiral pair of carriages supported on and movable longitudinally of the main carriage, second drive means fixed on the main carriage and connected to move the second pair of carriages toward and away from each other, a trimming blade supported respectively on each of the second pair of carriages, a sensor supported on and movable parallel to the beam relatively of each of the first pair of carriages for sensing respectively the edges of a carcass of an industrial belt, each sensor being capable of providing a signal proportional to the amount and direction of a deviation in location of said carcass edge, and hydromechanical drive means responsive to said signals to move each of said sensors relative to the respectively associated carriage and to move said main carriage a distance equal to one-half the algebraic sum of the deviations of said carcass edge.

4,070,940

MACHINE TOOL WITH PROTECTIVE LIGHT CURTAIN AND WORK STOCK HOLDING MECHANISM

John H. McDaniel; Harry W. Sinnard, both of Decatur, and Robert W. Thomas, Blue Mound, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 1, 1977, Ser. No. 764,666
Int. Cl.² B26D *7/02, 7/24*
U.S. Cl. 83—464 **14 Claims**



1. In combination with a machine tool of the type having guide means with a surface for receiving work stock and having a tool element which is selectively movable to perform a machine operation on said work stock at a predetermined work zone and further having an electrically controlled device for stopping motion of said tool element, mechanism for protecting and assisting an operator stationed in front of said machine tool comprising:

a radiant energy source positioned to direct radiant energy across a planar area extending between said work zone and said operator's station,

a radiant energy sensor positioned to intercept radiant energy which has traveled across said planar area and having means for producing a signal indicative of a decrease of intensity of the intercepted radiant energy, means transmitting said signal to said electrically controlled device to stop motion of said tool element in response to said decrease of intensity of intercepted radiant energy, and

manually operable auxiliary hold-down means for clamping said work stock against said guide means surface, said auxiliary hold-down having an actuating element situated outside the region between said planar area and said work zone.

4,070,941

SLICING MACHINE

Horst Lorenz, Solingen, Germany, assignor to Firma Robert Krups, Solingen, Germany

Filed Aug. 5, 1976, Ser. No. 711,874
Claims priority, application Germany, Apr. 13, 1976, 7611681[U]
Int. Cl.² B26D *4/04, 4/20*
U.S. Cl. 83—478 **15 Claims**

1. A slicing machine comprising:

a housing;

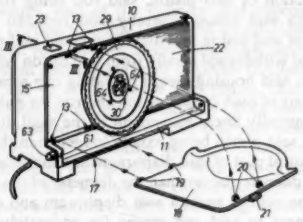
a blade rotatable on said housing about a generally horizontal axis;

drive means in said housing for rotating said blade about said axis;

means connected to said drive means including a start element displaceable between an on position for operating

said drive means and an off position in which said drive means is inoperative;

a cover plate movable on and relative to said housing independently of said start element between a closed position closely juxtaposed with said housing and covering most of



said blade and an open position spaced from said housing and exposing said blade; and

means including a link engageable with said plate and with said start element for preventing displacement of said start element from said off position into said on position except when said plate is in said closed position.

4,070,942

TONE GENERATOR

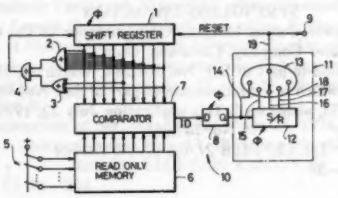
Eiichiro Aoki, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hammamatsu, Japan

Filed Dec. 9, 1976, Ser. No. 748,969

Claims priority, application Japan, Dec. 11, 1975, 50-148065; Dec. 11, 1975, 50-148066; Dec. 11, 1975, 50-148067

Int. Cl.² G10H *1/00*

U.S. Cl. 84—1.01 **6 Claims**



1. In a tone generator including a counting circuit for successively changing the content thereof in accordance with a clock pulse and a comparison circuit for comparing the content of the counting circuit with a set value for da depressed key to detect coincidence between the content and the set value, the coincidence detection output of said comparison circuit being utilized as a reset signal for resetting said counting circuit and an output pulse of a desired interval being produced at a timing of resetting of said counting circuit, the improvement which comprises:

first means for delaying the coincidence detection output of said comparison circuit sequentially and successively in a plurality of stages; and

second means for selectively supplying a plurality of delayed outputs differing in delay time to said counting circuit as the reset signal;

the interval of said output pulse being changed by delaying the timing of resetting said counting circuit.

4,070,943

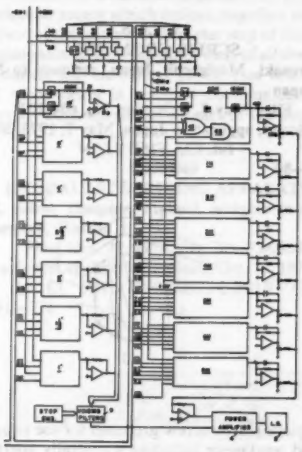
ELECTRONIC ORGAN KEYING SYSTEM

Alfred H. Faulkner, 1324 Portesuello Ave., Santa Barbara, Calif. 93105

Filed Sept. 5, 1975, Ser. No. 610,772

Int. Cl.² G10H *1/00*

U.S. Cl. 84—1.01 **8 Claims**



7. An envelope signal source, a preamplifier, a pair of switches and two resistors in series connected between said source and said amplifier in a balanced configuration, a source of square wave tone signals in phase with sin ωt connected to said switches so as to close them alternately during successive half cycles, a third switch connected in shunt with one of said resistors, and a source of square wave tone signals in phase with cos 2ωt connected to said third switch so as to close it during alternate half cycles, whereby the third and fifth harmonic components in the amplifier tone signal output are controlled in accordance with the ratio between said two resistors.

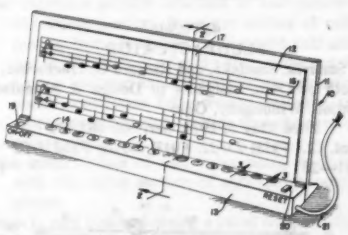
4,070,944

OPTICAL METRONOME

Juan M. del Castillo, Risco 119, Mexico City 20, D.F., Mexico

Continuation-in-part of Ser. No. 594,092, July 8, 1975, Pat. No. 3,996,833. This application June 24, 1976, Ser. No. 699,637

Int. Cl.² G10B *15/00*

U.S. Cl. 84—484 **7 Claims**

1. An optical metronome for visually indicating the note to be played and the duration of the note on a sheet of music having at least two parallel staves comprising

means for supporting a sheet of music,

a housing along an edge of said supporting means in front of a sheet of music and parallel to the staves, and extending at least the length of a staff on the sheet of music,

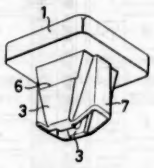
and means in said housing to project a series of vertical columns of light successively across the staves on the front of the sheet of music in timed relation to the tempo of the music being played from the sheet of music and spaced at the smallest note time interval with the notes on the sheet of music spaced at intervals related to the duration of each note.

4,070,945

SCREW GROMMET

Mutsuo Kurosaki, Moriguchi, Japan, assignor to Nifco Inc., Tokyo, Japan

Filed May 7, 1976, Ser. No. 684,202
Claims priority, application Japan, May 7, 1975, 50-60639[U]
Int. Cl.[2] F16B *13/04*
U.S. Cl. 85—80 **2 Claims**



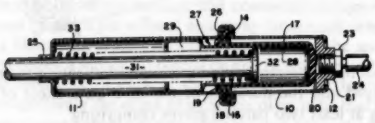
1. A one-piece plastic screw grommet for use in a non-circular apertured workpiece including a centrally apertured head adapted for accepting a screw therethrough, a pair of leg members extending downwardly from the underside of said head in spaced opposed relation, the inner opposed surfaces of said legs carrying concavities forming a tapered through bore co-axial with said aperture through the head, the lateral edges of each leg being axially tapered inwardly from said head toward their opposite free end, the outer surface of each said leg being tapered outwardly from its free end to a point intermediate its length to form shoulder means, a pair of generally flexible U-shaped web means having a pair of arms and a base with said web means having a thickness substantially less than the thickness of said legs, each web means extending from the underside of said head to adjacent the free end of said legs and with the arms of each web attached to the axially tapered adjacent lateral edges of the legs intermediate the inner and outer surfaces of said legs and having an increasing height from adjacent said head to said free end, whereby each said base of said pair of web means extending substantially parallel to one another and to the axis of said bore with the increased extent of said U-shaped web adjacent the free end of said legs thereby providing substantially unrestricted flexure of said legs when a screw is telescoped into said legs and causes this separation by contact with the tapered bore.

4,070,946

FLUID ACTUATOR

Roger H. Sandvik, Eastlake, and Richard G. Huebscher, Cleveland, both of Ohio, assignors to Design & Manufacturing Corporation, Willoughby, Ohio

Filed May 3, 1976, Ser. No. 682,192
Int. Cl.[2] F15B *15/22*; F01B *19/04*; F16J *3/02*
U.S. Cl. 91—25 **1 Claim**



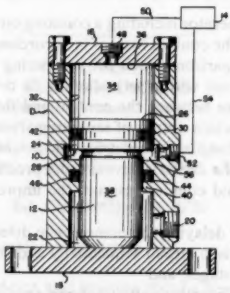
1. A linear fluid actuator comprising housing means having a fluid chamber, a folded diaphragm forming a movable wall of said chamber, the central part of said diaphragm being cylindrical and normally projecting into said chamber, a piston having a hollow central cylindrical section closely contained within the like part of said diaphragm, the admittance of fluid under pressure to said chamber causing said diaphragm to roll to expand said chamber and thereby move said piston, a piston rod at least partly contained within said hollow central cylindrical section of said piston, said rod being rotatable freely relative to said piston whereby said rod can turn without twisting of said piston and diaphragm, and said rod also being capable of withdrawal axially from said piston without moving the latter, said housing means including cap means containing at least part of each of said piston and rod for guiding the same for substantially linear movement in the axial direction of the actuator, said piston being axially longer than the axial length of the central part of said diaphragm and including skirt means having a diameter larger than the diameter of the piston section within the central part of said diaphragm and closely fitting with respect to said cap means for accurately guiding said piston for such linear movement, said skirt means including an appreciable surface area along the axial extent of the actuator in such closely fitting relationship with said cap means and being cooperable with the latter to hold said piston and said diaphragm in relatively fixed radially spaced relationship with respect to said housing means, return spring means between said cap means and said rod for normally urging the latter to engagement with said piston and said piston and diaphragm in a direction in said housing means to reduce said chamber, a portion of said spring means being accommodated within said piston, said housing means including fluid inlet means in a wall thereof for supplying fluid to said chamber, and said diaphragm including exteriorly projecting bumper means on the movable wall thereof directly facing said fluid inlet means for abutting said wall of said housing means in covering relationship with respect to said fluid inlet means to space said movable wall from said housing means when the actuator is not energized and said chamber is unexpanded, said bumper means having channel means therein for passing fluid from said fluid inlet means into said chamber for substantially uniform distribution of fluid in said chamber to energize the actuator and to expand said chamber.

4,070,947

SPRINGLESS IMPACTOR

John L. Crewse, Parma Heights, Ohio, assignor to The Cleveland Vibrator Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 561,284, March 24, 1975, abandoned, which is a continuation-in-part of Ser. No. 408,554, Oct. 23, 1973, abandoned. This application July 22, 1976, Ser. No. 707,561
Int. Cl.[2] F15B *21/02, 15/17, 13/044*
U.S. Cl. 91—39 **1 Claim**



1. A pressurized fluid operated springless impactor comprising, an upstanding closed-end cylinder having a top end plate and a bottom end impact plate, said cylinder having a bottom

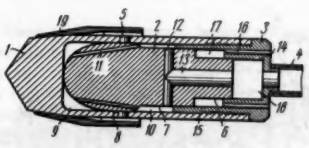
exhaust port connecting the lower cylinder interior portion with the atmosphere, a piston operatively disposed in said cylinder for reciprocation therein, said piston having a piston head with the top end of the head having a larger cross-sectional area than the bottom end thereof, whereby the bottom end of the piston head forms a shoulder of less area than the top end of the piston head, said cylinder having an inwardly extending circumferential guide sleeve portion formed on the inner longitudinal wall of the cylinder and encompassing a piston lower portion to guide the piston longitudinally in the cylinder when it reciprocates therein, said guide sleeve portion having a resilient packing seal ring disposed circumferentially therearound and in contact with said piston, said seal ring structured to effect at all times a one-way check valve providing flow only toward the piston head top, said head top end having a second resilient packing seal ring disposed circumferentially therearound and in contact with the cylinder inner longitudinal wall, said second seal ring structured to effect at all times a one-way check valve providing limited flow of pressurized fluid interiorly of the cylinder in one direction only from the piston head top end past the side of the piston head to the bottom end of the piston head, the cylinder top end plate having a top port therein, said cylinder having a side fluid port above said guide portion connected to a fluid control timer means for feeding and exhausting pressurized fluid to the bottom side of the piston head to effect preselected control reciprocation of the piston, and said fluid control timer means also feeding and exhausting pressurized fluid to and from the top interior portion of the cylinder between the piston head top end and the adjacent top end of the cylinder, and said coacting fluid control means connected with said side fluid port for exhausting fluid when the fluid pressure beneath said piston head top end exceeds the pressure in said cylinder top end, whereby to effect impactor reciprocation against the impact plate when the fluid control timer means alternately feeds and exhausts pressurized fluid to and from the top interior portion of the cylinder.

4,070,948

PNEUMATIC IMPACT DEVICES

Khaim Berkovich Tkach, ulitsa Gogolya, 17, kv. 49; Alexandr Dmitrievich Kostylev, ulitsa Derzhavina, 19, kv. 44; Konstantin Konstantinovich Tupitsyn, ulitsa Krylova, 3, kv. 37; Konstantin Stepanovich Gurkov, ulitsa Derzhavina, 19, kv. 13; Vladimir Vasilievich Klimashko, ulitsa Novogodnaya, 44, kv. 24; Leonid Georgievich Rozhkov, ulitsa Krylova, 41, kv. 40, all of Novosibirsk; Mikhail Jurievich Bondar, ulitsa Zhukovskogo, 22a, kv. 4, Odessa, and Boris Nikolaevich Smolyanitsky, ulitsa O.Dundicha, 27, kv. 18, Novosibirsk, all of U.S.S.R.

Continuation of Ser. No. 484,224, June 28, 1974, abandoned.
This application Nov. 13, 1975, Ser. No. 631,622
Int. Cl.[2] E21B *1/06;* **E21C** *19/00*
U.S. Cl. 91—234 **6 Claims**



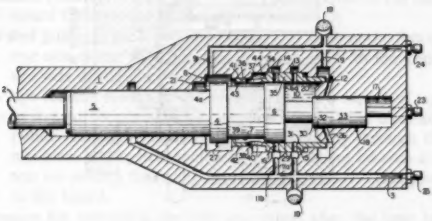
1. A pneumatic impact device, comprising a hollow, cylindrical casing having side walls and an open end, said side walls having holes; a nut which closes the open end of said casing; a stepped ram located in said casing with a provision for reciprocating motion; an axial channel and radial channels in said ram; a compressed air line, said axial and radial channels being connected to the compressed air line; a step of said ram with a minimum diameter, said step of minimum diameter being located in said nut; another step of said ram with a maximum diameter and serving as the front part of said ram, said maximum-diameter step defining, together with the side walls of said casing, a working chamber receiving compressed air from said compressed air line through said channels of the ram, the pressure of this air being used to move the ram for striking a blow after which the air is discharged through said holes of the casing, and longitudinal channels in said maximum diameter step opening at one end into said working chamber for its periodical connection with said compressed air line, said casing having a circular recess which defines, together with the cylindrical surface of the minimum diameter step of the ram, a space which communicates with the other ends of all the longitudinal channels during the movement of the ram towards the nut, with said space being in constant communication with the atmosphere through longitudinal holes in the nut.

4,070,949

HYDRAULIC STRIKING APPARATUS

Pekka M. Salmi, Tampere, Finland, assignor to Oy Tampella AB, Tampere, Finland

Filed Oct. 20, 1976, Ser. No. 734,038
Claims priority, application Finland, Oct. 20, 1975, 752909/75
Int. Cl.[2] F01L *17/00, 25/04;* **F01B** *7/18*
U.S. Cl. 91—276 **3 Claims**



1. In an improved hydraulic striking apparatus of the type having a body having wall means defining a cylindrical space therein having a cylindrical inner surface and end walls, a piston axially movable in said space, and a sleeve type distributing valve in said space between said piston and said inner surface, the improvement comprising:

an annular member extending radially inwardly from said inner surface and dividing said space into first and second portions;

said piston having a flange portion axially movable radially inwardly of said annular member;

said distributing valve having

a distributor portion disposed in said first portion of said space between said annular member and one of said end walls and in sliding contact with said inner surface, said distributor portion having a first annular end surface on which fluid under continuous full pressure acts; and

an extension portion attached to and slidable with said distributor portion, the outer surface of said extension portion being in sliding contact with said annular member in all positions of said valve, said extension portion having a second annular end surface against which fluid under continuous full pressure acts, the area of said second surface being smaller than the area of said first end surface;

the inner surface of said valve being in sliding contact with the outer surface of said flange portion of said piston;

means in said piston defining a canal for permitting flow of fluid axially past said annular member;

a shoulder on said distributor portion adjacent said extension portion, said shoulder, said annular member, said inner surface of said space and the outer surface of said extension portion defining a distributor space; and

means in said extension portion defining radial openings for permitting fluid under pressure to pass therethrough;

said canal means and said radial openings providing a fluid

path from said second portion of said space to said distributor space, said flange portion of said piston being movable toward said said first space portion to close said path.

4,070,950

HYDRAULIC APPARATUS INCLUDING ROTARY VALVE

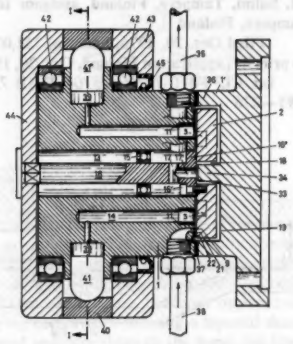
Ivan Jaroslav Cyphelly, Forchstrasse 968, Hinteregg, Switzerland (8128)

Filed Nov. 10, 1975, Ser. No. 630,347

Claims priority, application Switzerland, Dec. 12, 1974, 16557/74

Int. Cl.[2] F01B *3/10*; F16K *11/06*

U.S. Cl. 91—487 **5 Claims**



1. Hydraulic apparatus comprising:

a. a valve casing having a body portion formed with at least one intake opening, at least one discharge opening, and a return opening;

b. a distributor having a front face and a rear face;

c. securing means securing said distributor to said body portion for angular movement relative to said body portion about an axis and for limited axial movement, said faces of the secured distributor extending radially relative to said axis;

d. operating means for moving said distributor about said axis,

1. said body portion having a planar face, said planar face and said front face being formed with respective recesses alignable for connecting said at least one intake opening with said at least one discharge opening in a predetermined angular position of said distributor for flow of fluid between said intake and discharge openings in a first path through said valve casing; and

e. cover means spacedly enveloping said distributor in sealing engagement with said body portion, said cover means and said rear face of said distributor bounding therebetween a chamber,

1. said planar face and said front face defining axially therebetween a first, annular, throttling gap offset radially outward from said recesses and connecting said intake opening with said chamber,

2. a face of said cover means and a portion of said rear face substantially coplanar with said planar face defining axially therebetween a second throttling gap connecting said chamber to said return opening,

3. said intake and return openings, said gaps, and said chamber defining a second path of fluid flow through said valve casing,

4. the effective flow section of said second path being smaller than the effective flow section of said first path.

4,070,951

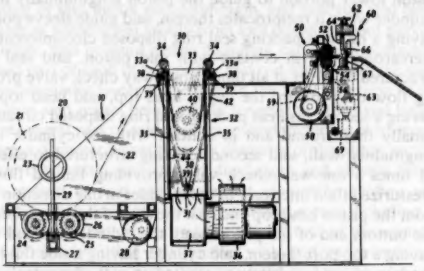
WEB HANDLING APPARATUS

John L. Bala, New Paltz, N.Y., assignor to Packaging Industries, Inc., Hyannis, Mass.

Division of Ser. No. 481,918, June 21, 1974, Pat. No. 3,948,425, which is a continuation-in-part of Ser. No. 382,319, July 25, 1973, abandoned. This application Apr. 6, 1976, Ser. No. 674,281

Int. Cl.[2] B65L *25/32*

U.S. Cl. 93—8 R **6 Claims**



1. Apparatus of the kind used to convey substantially wide and continuous lengths of sheet plastic past a series of downstream process stations continually operating on said sheet including:

drive means for intermittently feeding said sheet to the downstream process stations;

an accumulator means including a container upstream of said drive means for receiving a loop of said sheet;

means for supplying sheet to said container;

vacuum means for withdrawing air from the container beneath the loop of sheet to provide a pressure differential across the sheet thereby to tension the sheet taken from the container by the drive means;

control means coupled to the drive means to control the feeding of sheet to the downstream process stations and including sensing means responsive to the amount of sheet within the container;

and means for adjusting the pressure differential produced by said vacuum means to modify the tension in the sheet.

4,070,952

CARTON STORAGE, FEEDING AND OPENING APPARATUS

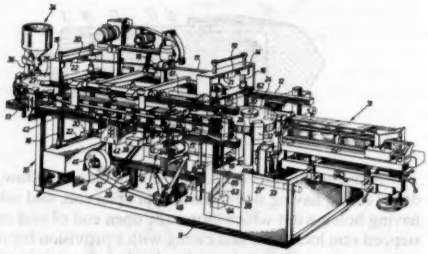
Hans Rolf Ingemar Linner, Helsingborg, Sweden, assignor to AB Akerlund & Rausing, Lund, Sweden

Filed Mar. 15, 1977, Ser. No. 777,720

Claims priority, application Sweden, Nov. 12, 1976, 7612635

Int. Cl.[2] B31B *1/06, 1/78*

U.S. Cl. 93—53 R **4 Claims**



1. Carton storage, feeding and opening apparatus for use in a packaging machine in which plane folding box blanks are fed to a conveyor with simultaneous opening of the folding box blanks which are subsequently fed one after another in a prede-

termined direction with substantially constant center-to-center distances to processing stations along the conveyor, said apparatus comprising:

a substantially horizontal storage bottom member, said bottom member being vertically adjustable;

a pair of side guiding means for folding box blanks substantially vertically carried by the storage bottom member, said side guiding means being adjustable independently of each other and of the storage bottom in longitudinal and latitudinal direction in relation to said storage bottom member; and

stop means mounted on said side guiding means at the discharge end of said apparatus adjacent said conveyor, said stop means adapted to fix the position of folding box blanks in a predetermined angular orientation with respect to the longitudinal direction of the storage bottom member.

4,070,953

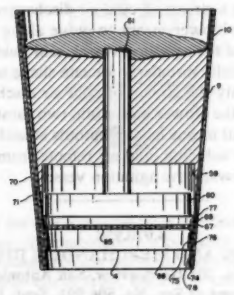
METHOD FOR PRODUCING A CONTAINER

Frank P. Richards, and Raymond C. Taylor, both of Kansas City, Mo., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 569,731, April 21, 1975, Pat. No. 3,990,353. This application June 10, 1976, Ser. No. 694,619

Int. Cl.² B31B *49/02*

U.S. Cl. 93—39.1 R **6 Claims**



1. A method of forming a container, said method including the steps of:

a. feeding a blank to forming means having a forming die with a through bore with a plurality of different sized forming areas;

b. forming a first fold line on said blank by passing same through one of the forming areas;

c. forming a second fold line on said blank by passing same through another one of the forming areas whereby said blank is formed into a bottom member having a bottom panel portion and a depending skirt portion with said first and second fold lines therebetween with said fold lines being generally concentric;

d. reducing the diameter of the first fold line to a diameter less than the formed diameter of the first fold line;

e. moving the skirt portion into engagement with a sidewall and allowing the diameter of the first fold line to expand from the reduced size; and

f. securing said bottom member skirt portion to an interior surface of said sidewall by adhesion to form a container.

4,070,954

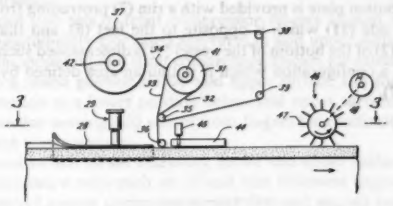
DUCT FORMING MACHINE

Ronald J. Cailey, San Antonio, Tex., assignor to Glass Master Corporation, San Antonio, Tex.

Filed Oct. 30, 1975, Ser. No. 627,376

Int. Cl.² B31B *3/60*; B31F *1/00*

U.S. Cl. 93—36.9 **11 Claims**



1. A duct closing machine comprising,

a plurality of rollers arranged in parallelogram form to guide a duct board folded in duct form through the machine,

said board having a flap of material on one side thereof,

means rotating at least one of said rollers to move the duct board through the machine,

a sled guide on the machine bending and holding the flap on one side of the duct board in engagement with the opposite side of the duct board,

a tape feeding system positioning the end of a supply of tape in line to be contacted by the lead end of the duct and pulled from the supply by the duct moving through the machine, said system including a tape facing take-up system for pulling the facing from the tape before it is applied to the board,

means for activating the take-up system after the tape has been contacted by the leading end of the duct and deactivating the system after the trailing end of the duct has had tape applied thereto,

a smoothing iron for applying the tape over the duct flap and adjacent portion of said other side of the duct board as the duct moves through the machine,

cutter means for severing the tape applied to the duct free from the supply,

means responsive to movement of the duct for operating said cutter means after the trailing end of the duct has passed the cutter means,

and wiper means said tape into firm engagement with said duct board as the duct leaves the machine.

4,070,955

COFFEE FILTER

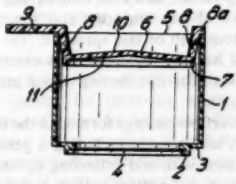
Werner Braun, Sarnent, Switzerland, assignor to Maxs AG, Sachseln, Switzerland

Filed Nov. 22, 1976, Ser. No. 743,679

Claims priority, application Germany, Nov. 25, 1975, 7537473[U]

Int. Cl.² A23F *1/08*

U.S. Cl. 99—284 **5 Claims**



1. A filtering device for the preparation of coffee, comprising a pot-shaped vessel, a sieve attached to the bottom of said vessel, and a water distribution plate adapted to be supported

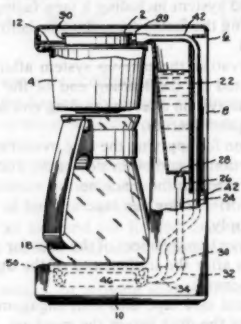
by the upper edge of said vessel, characterized by the fact that the diameter of the water distribution plate (6) is smaller than the inner diameter of the vessel (1), that at least three feet (8) protrude from the edge of the water distribution plate generally perpendicularly to the surface of the same, that the free ends of the feet (8) are provided with shoulders (8*a*) adapted to be put onto the upper edge (5) of said vessel, that the water distribution plate is provided with a rim (7) protruding from its front side (11) which is opposite to the feet (8), and that the edge (2) of the bottom of the vessel (1) is dimensioned such that it has a configuration which is within an area defined by said rim (7).

4,070,956

COFFEEMAKER WITH BREWING WATER SPREADER

Richard N. Brown, Macungie, Pa., assignor to General Electric Company, Bridgeport, Conn.

Filed July 12, 1976, Ser. No. 704,348
Int. Cl.[2] A47J *31/057, 31/44*
U.S. Cl. 99—304 **5 Claims**



1. An electric coffeemaker comprising:

a. means for heating water;

b. a ground coffee basket for receiving dry ground coffee and heated brewing water;

c. a heated water spreader positioned generally above said ground coffee basket for receiving heated brewing water from said heating means and for distributing heated water into the ground coffee basket;

d. said spreader including a bottom wall having an upper surface and a lower surface and a cylindrical vertical side wall and a top cover; said side wall having a plurality of generally vertical tabs engaging and spacing the cover from the bottom wall of said spreader;

e. a plurality of heated water openings extending through said bottom wall for distributing water into the ground coffee basket; and

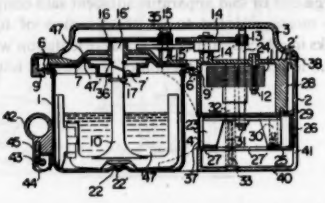
f. an enlarged overflow passage formed in the bottom wall of said spreader, said passage including a generally vertical dam wall formed with and extending upwardly from the upper surface of said bottom wall as a generally vertical cylindrical wall for permitting heated brewing water to flow over the dam wall through the overflow passage and into the ground coffee basket when the spreader has been filled with heated brewing water above the dam wall.

4,070,957

ICE CREAM MACHINE

Takashi Korekawa, Osaka; Nobuo Kato, Ikeda, and Mikio Yamaoka, Takatsuki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 425,795, Dec. 18, 1973, abandoned. This application Aug. 22, 1975, Ser. No. 606,952
Claims priority, application Japan, Dec. 20, 1972, 47-147172[U]; Nov. 28, 1973, 48-138219[U]; Nov. 28, 1973, 48-134759; Nov. 28, 1973, 48-134760; Nov. 28, 1973, 48-134761
Int. Cl.[2] A23C *3/04*; B01F *7/16*; A23G *9/00*
U.S. Cl. 99—455 **1 Claim**



1. An ice cream machine for use in a cold air environment comprising a stationary agitation vessel of a substantially cylindrical shape for containing an ice cream mix therein, rotatable agitation means for agitating the ice cream mix in the agitation vessel, blower means provided with a cold air inlet port and a cold air outlet port, said outlet port disposed in the vicinity of the agitation vessel, said blower means receiving cold air from said cold air environment through said inlet and blowing said cold air through said outlet port perpendicularly against the peripheral wall of the agitation vessel, and guide wall means having opposite side edges located adjacent said agitation vessel for guiding a stream of cold air discharged through the outlet port of the blower means to move along the outer peripheral surface of the agitation vessel, said guide wall means having a substantially circularly arcuate shape so as to divide substantially evenly the stream of cold air discharge through the outlet port of the blower means into two substreams of cold air, said guide wall means having cutouts at said opposite side edges thereof for inducing cold air remote from the agitation vessel to move toward the agitation vessel.

4,070,958

MEAT SMOKING AND MERCHANDISE DISPLAY CASE

Bruce W. Canright, 204 Gardenview, San Antonio, Tex. 78213

Continuation-in-part of Ser. No. 506,991, Sept. 18, 1974, Pat. No. 3,942,425. This application Mar. 8, 1976, Ser. No. 664,558
Int. Cl.[2] A01J *11/00*; A23B *4/04*
U.S. Cl. 99—468 **9 Claims**

1. A meat smoking and merchandise display case adapted to treat food products by smoke producing means comprising

a base,

an outer casing mounted on said base,

at least a portion of said outer casing of transparent material,

said case terminating upwardly in a shaped canopy,

an elongated, vertically extending inner casing rotatably mounted in said outer casing,

means to rotate said inner casing,

food product support means on said inner casing,

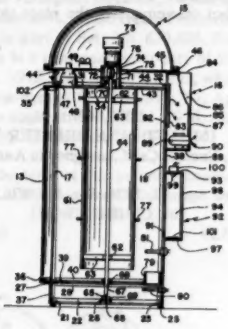
said smoke producing means in proximity to said base intermediate said outer and inner casings,

heating means adapted to activate said smoke producing means,

temperature control means adapted to regulate said heating means,

smoke control means adapted to detect the smoke density and to regulate said heating means when the smoke from

said smoke producing means exceeds a predetermined density, and



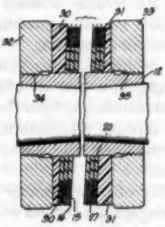
means responsive to said smoke control means to selectively exhaust the smoke from said case.

4,070,959

APPARATUS FOR EXTRACTING OIL FROM THE RIND OF WHOLE CITRUS FRUIT

Ronald C. Bushman, Hacienda Heights, and Franklin K. Holbrook, La Habra, both of Calif., assignors to Brown International Corporation, Covina, Calif.

Filed Feb. 2, 1976, Ser. No. 654,640
Int. Cl.[2] A23N *1/00;* **B02C** *15/00;* **B26D** *1/00*
U.S. Cl. 99—510 **2 Claims**



1. Apparatus for extracting oil from the rind of whole citrus fruit, comprising, in combination: a plurality of parallel horizontal rolls defining troughs between them for reception and support of whole citrus fruit, each roll comprising a shaft having an axis of rotation, a series of parallel rings mounted in inclined position on the shaft, each ring being formed of thin metal and having a continuous series of pointed teeth on its periphery, a plurality of spacer disks each mounted on the shaft between two adjacent rings, means for clamping said metal rings and spacer disks end to end, a plurality of annular washers each loosely encircling a spacer disk and having clearance space between adjacent rings, whereby rotary movement of the shaft, rings and spacers causes wobble movement of the disk peripheries, radial movement of the washers serving to displace material accumulating between adjacent rings.

4,070,960

APPARATUS FOR PACKING FLAT ARTICLES

Arthur A. Diluiso, Beverly, Mass., assignor to Post Machinery Company, Inc., Beverly, Mass.

Filed Aug. 23, 1976, Ser. No. 716,951
Int. Cl.[2] B30B *15/14*
U.S. Cl. 100—49 **5 Claims**

1. Apparatus for packing stacks of flat articles in a box, which apparatus comprises

a frame having a flat upper surface including a receiving region and a packing region spaced longitudinally from each other, and first switch means located between said regions and protruding from the surface thereof,

at least two sets of rear abutment fingers,

means mounting said rear fingers for movement between raised positions extending upward through holes in said upper surface and retracted positions below said upper surface,

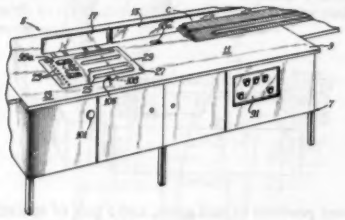
at least two sets of front compression fingers aligned with longitudinally elongated apertures in said upper surface,

means mounting said front compression fingers for extension to a raised position above said upper surface and for retraction to a lower position below said upper surface,

means for moving said sets of front fingers longitudinally of said upper surface,

second switch means extending above said upper surface in association with each set of said rear abutment fingers,

a control system connected to said first and second switch



means so that actuation of said first switch means by sliding movement thereover of a first stack of flat articles causes extension of said rear abutment fingers and actuation of said second switch means adjacent a first set of said rear fingers causes extension of a first set of said front compression fingers and longitudinal movement thereof to compress the first stack of articles therebetween, and so that subsequent actuation of said second switch means adjacent a second set of rear abutment fingers by sliding movement of a second stack of flat articles thereover causes extension of a second set of said front compression fingers and longitudinal movement thereof to compress the second stack therebetween, and

air nozzle means mounted on said frame for blowing a stream of air transversely across said upper surface so as to hold a flat divider in vertical orientation against said compressed first stack of articles to provide a separator and guide against which the second stack of articles can be evenly arranged in abutting contact.

4,070,961

WASTE DIVERTER APPARATUS FOR A WASTE DISPOSAL SYSTEM

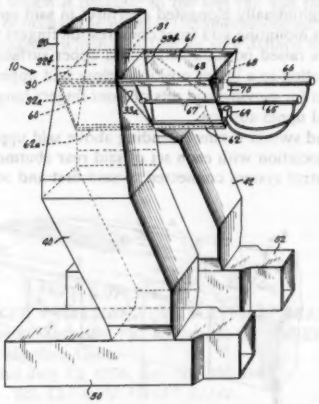
James O'Rourke, Waldwick, N.J., and Murray Feldberg, Brooklyn, N.Y., assignors to Multi-Pak Corporation, Hackensack, N.J.

Filed Dec. 4, 1975, Ser. No. 637,532
Int. Cl.[2] B30B *15/30;* **B65G** *11/20*
U.S. Cl. 100—185 **4 Claims**

1. An improved waste disposal system of the type having a single waste supplying chute, a waste diverter housing having a waste inlet opening for receiving waste from said waste supplying chute and means for selectably directing said waste to a pair of waste outlet openings in said diverter housing, a pair of waste compactors, and a pair of waste outlet chutes for connecting each said waste compactor to a waste outlet opening of said waste diverter, wherein the improvement comprises:

separate waste outlet gates for each of said waste outlet openings, said gates being horizontally slidable between a

first position substantially outside said diverter housing which opens their corresponding waste outlet openings and a second position substantially within said housing which closes said corresponding waste outlet openings and being substantially equal in size to said waste outlet openings; means for slidably supporting said horizontally slidable gates ... consisting of a single horizontal lower support element having two slotted tracks to receive the



lower portions of said gates, and a pair of spaced horizontal upper support elements, each parallel to said lower support element and having a single slotted track to receive the upper portion of one of said gates, said upper and lower horizontal support elements slidably supporting said gates in a vee configuration; and

control means for independently driving each of said gates between said first position and said second position.

4,070,962

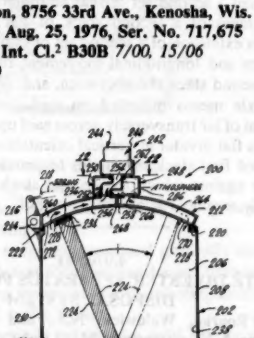
REFUSE COMPACTORS

Robert A. Peterson, 8756 33rd Ave., Kenosha, Wis. 53140

Filed Aug. 25, 1976, Ser. No. 717,675

Int. Cl.[2] B30B *7/00, 15/06*

U.S. Cl. 100—209 **34 Claims**



1. A refuse compactor comprising:

a refuse container including relatively rigid walls and a movable pressure plate normally disposed in mutual fluid sealing relation to form a refuse receiving space at one side of said plate;

means providing access to said space for placement of refuse in and removal of refuse from said space;

means supporting said pressure plate for movement relative to said walls in the direction of said space through a refuse compression stroke to compress refuse in said space and in the opposite direction through a return stroke;

and pressure plate operating means for selectively evacuating said space to effect movement of said pressure plate through its compression stroke by atmospheric pressure and producing a pressure differential across said pressure plate to effect movement of the plate through its return stroke.

4,070,963

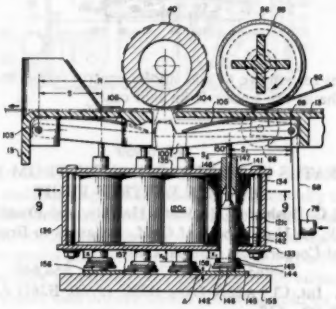
IMPACT LINE PRINTER

John H. Weaver, Encino, Calif., assignor to Anadex, Inc., Chatsworth, Calif.

Filed Apr. 12, 1976, Ser. No. 676,094

Int. Cl.[2] B41J *9/38*

U.S. Cl. 101—93.29 **12 Claims**



1. In an impact line printer wherein a plurality of pivoted print hammers impact a printing medium against moving type faces, the improvement comprising:

a first plurality of print hammer actuator solenoids for respectively engaging a first set of said print hammers of predetermined distance S_1 from the hammer pivot axis to push directly through a predetermined distance of armature movement X_1 on said hammers for impacting the printing media,

a second plurality of print hammer actuator solenoids for respectively engaging a second set of said print hammers of predetermined different distance S_2 from the hammer pivot axis to push directly through a different predetermined distance of armature movement X_2 on said hammers for impacting the printing media, said distances of movement of solenoid armatures X_1 and X_2 as well as said distances from the hammer pivot axis S_1 and S_2 being appropriately selected to achieve substantially the equivalent impact printing forces against said moving type faces;

a platen subassembly comprising a unitary molded plastic platen member having a series of comb-like guides for said print hammers, said print hammers being pivoted within said guide by pivot means on said platen member, said platen member having a support surface for the printing media and a plurality of openings therethrough large enough to accommodate the heads of said print hammers so that energization of the actuator solenoid drives its associated hammer head through said opening to press the printing medium on said platen surface against one of said moving type faces; and

means for driving said printing medium comprising a driven roller and clamp means for clamping said printing medium against said driven roller, said clamp means including a pinch roller rotatably mounted on a pivoted lever having an extended lever arm for engagement by an actuator means, said extended lever arm having a degree of flexibility so that printing media of varying thickness is accommodated by flexure of said lever arm.

4,070,964
THIN FLEXIBLE METAL SQUEEGEE BLADE FOR ROTARY SCREEN PRINTER

Jacobus Gerardus Vertegaal, Boxmeer, Netherlands, assignor to Stork Amsterdam B.V., Amstelveen, Netherlands

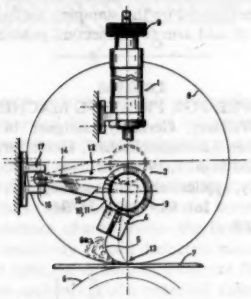
Continuation-in-part of Ser. No. 630,815, Nov. 11, 1975, abandoned, which is a continuation-in-part of Ser. No. 383,155, July 27, 1973, Pat. No. 3,933,093, which is a continuation-in-part of Ser. No. 811,787, April 1, 1969, abandoned. This application May 21, 1976, Ser. No. 688,613

Claims priority, application Netherlands, Apr. 25, 1968, 6805845

The portion of the term of this patent subsequent to Dec. 21, 1993, has been disclaimed.

Int. Cl.[2] B41F *15/44*

U.S. Cl. 101—120 **10 Claims**



1. A squeegee blade for a rotary printing machine and comprising a thin flexible resilient metal strip having an edge thereof attached to a squeegee holder within a cylindrical screen stencil of the rotary printing machine such that a portion thereof freely protrudes from the holder, said blade having a transverse trailing edge for contacting the inner surface of a stencil in the region of the zone of the stencil contacting the material to be printed, said blade having a thickness of less than 1.0% of the width of its freely protruding portion, said blade being flexible through an angle ranging from 90° to 3° with respect to the inner surface of the stencil to vary selectively the quantity of printing fluid pressed through the stencil by the blade trailing edge.

4,070,965
SEQUENTIAL ROTARY PRINTING PRESS WEB THREADING MEANS

Werner Aenishaenslin, Egerkingen; Fritz Suter, Boll; Ulrich Pfeuti, Worb, and Paul Haag, Bern, all of Switzerland, assignors to Maschinenfabrik Wifag, Bern, Switzerland

Continuation of Ser. No. 571,972, April 28, 1975, abandoned. This application Nov. 3, 1976, Ser. No. 738,285

Claims priority, application Switzerland, May 6, 1974, 060393/74; Apr. 28, 1975, 049312/75

Int. Cl.[2] B41F *13/02*

U.S. Cl. 101—228 **5 Claims**

1. A rotary printing press assembly including apparatus for initially threading and conveying continuous webs of material therethrough comprising:

a plurality of sequentially arranged printing units having said material webs pass serially therethrough;

endless chain conveyors for each of said printing units for driving said materials;

a lead-in bar attachable to said conveyors and capable of having said material web attached thereto;

a gravure cylinder and impression cylinder between which said material web is engaged when passing through each of said printing units;

a feeding station for each of said printing units for receiving said web prior to engagement thereof with said gravure cylinder and impression cylinder of each printing unit;

a rotary field motor for driving said endless conveyor chains in each said printing unit during the threading operation;

series-connected limit switches actuated by said lead-in bar for controlling operation of said rotary field motors;

engagement and disengagement means for sequentially connecting said lead-in bar to said chain conveyor at each of said feeding stations of said printing units and for disengaging said lead-in bar when said lead-in bar has passed through said printing units to enable engagement thereof by the chain conveyor of a next succeeding printing unit;

said engagement and disengagement means comprising

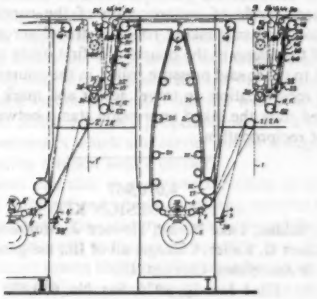
a carrier bracket mounted on said chain conveyor,

a pawl pivotally mounted on said carrier bracket,

a locking bolt fixed to said carrier bracket,

a cam surface formed on said lead-in bar adapted to be engaged by said pawl,

a recess formed in said lead-in bar located to have said pawl guided by said cam surface into locking engagement therewith to effect driving of said lead-in bar by said chain conveyor, and



a bore formed in said lead-in bar located to have said locking bolt engaged therein to hold said lead-in bar against lateral movement relative to the driving direction of said chain conveyor;

a transfer station including means for actuating said engagement and disengagement means to disengage said lead-in bar from said chain conveyor when said lead-in bar has passed through a printing unit;

said transfer station including means for transferring said lead-in bar between the chain conveyors of adjacent printing units;

said series-connected limit switches being arranged to be actuated by said lead-in bar to start the rotary field motors of each of said conveyor chains when said lead-in bar introduces said material web thereinto and to stop said rotary field motors when said lead-in bar is transferred to a next adjacent printing unit;

said material web being connected to one end of said lead-in bar and sequentially passed through said plurality of printing units by sequential engagement and disengagement of said lead-in bar with the chain conveyors of each of said printing units.

4,070,966
APPARATUS FOR MARKING DOCUMENTS

Guy Edon, Angers, France, assignor to Compagnie Honeywell Bull, Paris, France

Filed June 23, 1976, Ser. No. 698,921

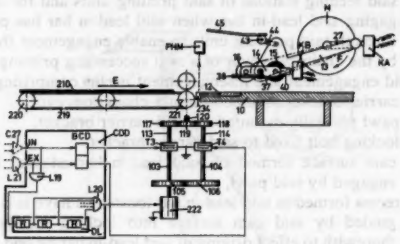
Claims priority, application France, July 31, 1975, 75 24020

Int. Cl.[2] B41F *3/20*

U.S. Cl. 101—269 **11 Claims**

1. A document marking apparatus comprising a fixed support provided with an impression stamp, a carriage mounted to

move over said support, drive means for imparting a reciprocating movement to said carriage, a shaft pivotally supported by said carriage and disposed parallel to said support and transversely to the direction of said reciprocating movement, a rotatable carrier mounted on said shaft and comprising an inking roller and a pressure roller parallel to said shaft and disposed on diametrically opposite sides of said shaft, and



means for continuously rotating said carrier about said shaft during each cycle of reciprocation of the carriage and arranged to cause said inking roller to travel across the entire extent of the stamp in the course of a first cycle of reciprocation, and to cause said pressure roller, in the course of a second cycle of reciprocation, to travel across and mark a document positioned over the inked impression stamp between said two cycles of reciprocation.

4,070,967

STAMP DESIGN KIT

Floyd E. Schlau, Lake Forest; Howard J. Morrison, Deerfield, and Albert G. Keller, Chicago, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Jan. 21, 1976, Ser. No. 650,895
Int. Cl.[2] B41F *1/04*
U.S. Cl. 101—301 **14 Claims**

1. A stamping kit, comprising:
a frame having two horizontal, generally elongated, diverging leg portions;
a selectively movable support arm mounted on the frame for movement between a first position above one of said leg portions and a second position, above the other of said leg portions;
an ink pad mounted on one of said leg portions and a stamping surface provided on the other of said leg portions; and
a stamp secured to said arm for selective movement therewith to contact said ink pad when the arm is in its first position to supply ink to the stamping surface and subsequent transferring of said ink to a suitable transfer sheet placed on the stamping surface by movement of said arm to said second position, wherein said second leg portion includes means for pivotally connecting the transfer sheet thereto to maintain proper rotational alignment between the successive ink transfers.

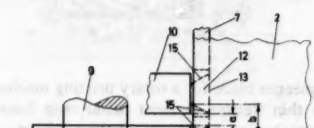
6. A stamping device, comprising:
a frame portion;
an ink pad;
a selectively movable support arm mounted on the frame by means permitting universal movement relative to said frame in a horizontal and vertical plane relative to said frame portion between at least a first position and a second position;
an ink pad mounted on said frame in vertical alignment with said support arm when in said first position and a stamping surface provided on the frame in vertical alignment with said support arm when in its second position;
a stamp for mounting on the support arm; and
a stamp carrier mounted on said support arm for mounting said stamp, said stamp being mounted by said stamp carrier to contact the ink pad when the support arm is in its first position to supply ink to the stamping surface thereof, and subsequently transferring of said ink to a suitable transfer sheet placed on the stamping surface by selective movement of said arm to the second position.

4,070,968

GRIPPER FOR PRINTING MACHINES

Alfred Zehe, Walldorf, Germany, assignor to Heidelberger Druckmaschinen Aktiengesellschaft, Heidelberg, Germany

Filed Sept. 7, 1976, Ser. No. 720,630
Claims priority, application Germany, Sept. 10, 1975, 2540218
Int. Cl.[2] B41F *21/04*
U.S. Cl. 101—408 **3 Claims**



1. In a gripper assembly for a printing machine, having a rotary member for carrying a sheet to be printed a gripper member mounted on the rotary and member having a gripper tip formed with a free edge and a clamping face thereat, said clamping face being cooperable with a gripper support for gripping the sheet therebetween, said clamping face being trapezoidal and having a pair of non-parallel sides and a pair of parallel sides of unequal length connecting said pair of non parallel sides the longer of the two parallel sides thereof being disposed at the free edge of said gripper tip whereby the gripped sheet extends beyond the longer of the two parallel sides of said clamping face and along said non-parallel sides thereof.

4,070,969

METHOD FOR STRENGTHENING LITHOGRAPHIC PRINTING PLATE IMAGES

Jack R. Helmer, River Falls, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed July 16, 1976, Ser. No. 705,874
Int. Cl.[2] B41N *3/00*; B41C *1/10*
U.S. Cl. 101—465 **2 Claims**

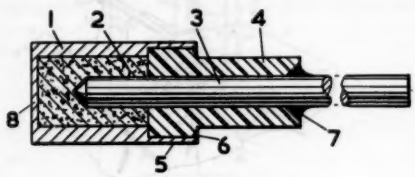
1. A process of strengthening lithographic plates comprising:
a. providing an exposed and developed olephilic image aluminum-based lithographic printing plate containing non-crosslinked resinous image areas thereon and hydrophilic non-image areas;
b. preserving the hydrophilic non-image areas and strengthening the image areas by applying a solution of triethanolamine titanate; and
c. heating the solution coated plate.

4,070,970

ELECTRO-EXPLOSIVE IGNITERS

William Bertram Scamaton, Orpington, England, assignor to The Secretary of State for Industry in Her Britannic Majesty's Government of the United Kingdom of Great Britain & Northern Ireland, London, England

Filed May 13, 1976, Ser. No. 686,065
Claims priority, application United Kingdom, May 14, 1975, 20469/75
Int. Cl.² F42B 3/18
U.S. Cl. 102—28 R 8 Claims



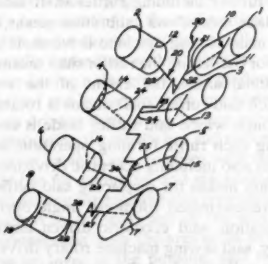
1. An electro-explosive igniter comprising two initiating electrodes separated by a layer of a pyrotechnic mixture of metal particles intimately and uniformly intermixed with particles of an oxidising agent for oxidising the metal particles, said mixture including particles of a dielectric material so selected and distributed in said mixture that said layer has a two-stage electrical resistance characteristic, the first stage having the natural high resistivity of said dielectric material of sufficient magnitude to limit the density of a current flow through said layer upon an application of a potential difference across the initiating electrodes to a level which is insufficient to initiate an exothermic reaction between said metal particles and said oxidising agent when said potential difference is less than a breakdown voltage at which the natural resistivity of said dielectric material degenerates, and the second stage, once said breakdown voltage has been exceeded, being the low resistivity of the resulting dielectrically degenerate mixture, the reduced magnitude of the low resistivity thereafter increasing the density of current flow to initiate said exothermic reaction.

4,070,971

ENGINE EFFICIENCY

Alden Henry Studebaker, 241 Nenue St., Honolulu, Hawaii 96821

Filed June 5, 1974, Ser. No. 476,564
Int. Cl.² F02D 13/06
U.S. Cl. 123—198 F 11 Claims



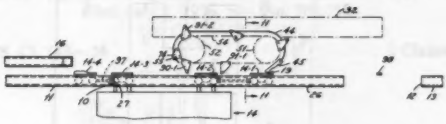
1. The method of improving engine efficiency comprising deactivating selected pistons in selected cylinders by removing the selected pistons, interrupting fuel supply to the selected cylinders, and operating the engine with the deactivated piston and interrupted fuel supply.

4,070,972

CARRIER PROPELLING MECHANISM FOR POWER AND FREE CONVEYORS

Harold A. Folsom, Livonia, and David G. Bilson, Detroit, both of Mich., assignors to Jervis B. Webb Company, Farmington Hills, Mich.

Filed Aug. 3, 1976, Ser. No. 711,403
Int. Cl.² B61B 10/02
U.S. Cl. 104—172 S 17 Claims



1. In a power and free conveyor including a carrier and a carrier supporting track section having an entrance end and an exit end, propelling mechanism for forwarding the carrier along said track section toward the exit end thereof comprising:

a double-ended flexible propelling member, one end of the propelling member being equipped with a carrier pusher;

means for supporting said propelling member including storage means and track means, said track means extending from said storage means toward the entrance end of said track section in parallel relation with said track section and defining for said propelling member a linear path of movement in which said carrier pusher is engageable in forwarding relation with a carrier;

drive means operable in a reverse direction to extend the pusher equipped end of said propelling member from said storage means along said track means toward the entrance end of said track section, and operable in a forwarding direction to return the propelling member to said storage means whereby a carrier engaged by said pusher is forwarded along said track section; and,

pusher means operably associated with said drive means for forwarding a carrier along said track section after said propelling member has been returned to said storage means.

4,070,973

MECHANIZED DISPLAY DEVICE

Jerome Morgan, 602 E. Kirby, Detroit, Mich. 48202

Filed May 19, 1976, Ser. No. 687,884
Int. Cl.² A47D 5/025
U.S. Cl. 108—20 12 Claims

1. A mechanized display device for advertising a product by displaying packages of the product, comprising:

at least one rotating, horizontally extending platform for supporting packages for the product;

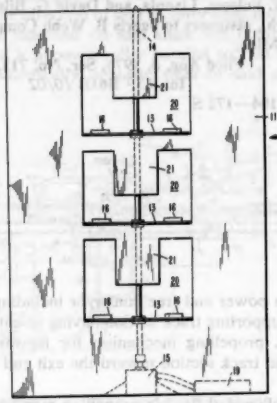
shaft means fixed to and supporting said platform for rotation about an axis;

a substantially hollow housing extending vertically and having front and rear surfaces and an opening extending therethrough, wherein said platform is disposed in said opening and extends beyond the front and rear surfaces of the housing, said housing supporting said shaft means;

electric motor means disposed within said housing and beneath said platform for driving said shaft to rotate said platform in said opening and relative to said housing wherein,

said platform means includes means thereon for retaining said packages, wherein said retaining means are arranged in a circular pattern around the axis of said shaft, and wherein said housing has a portion which projects from

the top of said opening in the direction of said axis and into said opening, so that said opening is U-shaped with the



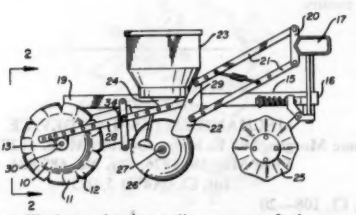
packages revolving around the projecting portion when retained on said platform by said retaining means.

4,070,974

DISC TRENCH FILLER FOR A NO-TILL PLANTER

Hugh E. Stacy, Jr., Rte. No. 2, Lowellville, Ohio 44436

Filed June 29, 1976, Ser. No. 700,975
Int. Cl.[2] A01C *5/06*
U.S. Cl. 111—85 **3 Claims**



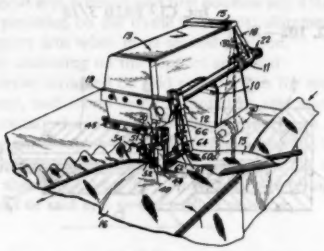
1. In a no-till planter having a disc opener of a known width arranged to form a shallow trench in the soil of a field to be planted, a hopper and a metering device for delivering seeds from the hopper to the trench formed by the disc opener; support means extending outwardly from said planter, a trench filler comprising a unitary disc journaled on said support means in trailing alignment with said disc opener, said disc having a peripheral edge, a plurality of individual alternately arranged opposite outwardly curving segments each integrally joined to the peripheral edge of said disc at the root of said segment, said segments each being curved in at least two planes and each being located immediately adjacent one another with said disc peripheral edge being formed entirely by said segment roots and adjacent segments are joined together solely at the roots thereof, the transverse spacing of the outermost edges of said curved segments being at least as great as the width of said disc opener and the shallow trench formed thereby so that the segments engage and move portions of the soil from the sides of the trench into the same.

4,070,975

RUFFLER ATTACHMENT FOR SEWING MACHINE

Richard Russell, Tappan, N.Y., assignor to U.S. Blind Stitch Machine Corporation, Plainview, N.Y.

Filed Nov. 26, 1975, Ser. No. 635,568
Int. Cl.[2] D05B *35/08*
U.S. Cl. 112—135 **7 Claims**

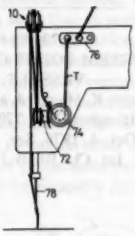


1. A ruffler assembly for use in a sewing machine having needle means including a needle, said needle means effecting periodic sewing displacement of said needle into a material to effect sewing of same, feed dog means including a feed dog constructed and arranged with respect to said needle to effect periodic displacement of said fabric after each sewing displacement of said needle, and rotary driving means coupled to said needle means and feed dog means for synchronizing the periodic fabric sewing and displacement operations respectively performed by said needle and feed dog means, said ruffler assembly comprising in combination a stiffener blade disposed to permit a body material to be introduced thereover into the sewing position of said needle to effect sewing thereof, feeder means for effecting the feeding of a trim material into contact with said stiffener blade, and a ruffler blade coordinately displaceable from a stiffener blade contact position to a ruffle-forming position proximate said needle sewing position, said ruffler blade at said first stiffener blade contact position being constructed and arranged to sandwich a portion of said trim material between said ruffler blade and said stiffener blade and thereby effect a folding of a portion of said trim material between the first stiffener blade contact position and sewing displacement position of said needle under the remaining portion of said trim fabric between said stiffener blade contact position and sewing displacement position of said needle, and oscillatory drive means coupled to said ruffler blade means and to said sewing machine rotary drive means for synchronizing said coordinate displacement of said ruffler blade from said first contact position to said ruffle forming position with said periodic sewing displacement of said needle and periodic displacement of said material by said feed dog, said oscillatory drive means further including ruffler shaft means coupled to the ruffler blade means, and calibration means disposed intermediate the main sewing machine drive shaft and the ruffler shaft means for oscillating the ruffler shaft means to a predetermined rotational angle, the extent of the rotational angle through which said ruffler shaft means is rotated defining the distance through which said ruffler blade is coordinately displaced during each ruffle forming operation, said oscillatory driving means also including eccentric drive means coupled to said calibration means for displacing said ruffler shaft means through a predetermined rotational angle during each ruffle forming operation, said eccentric driven means including a driven pulley, said sewing machine rotary drive means including a driving pulley, and a belt coupled to said driving pulley and driven pulley to effect driving of said driven pulley thereby, the gear ratios between said drive pulley and said driven pulley being selectively variable so that said variable gear ratios determine the number of pleats to be formed for each sewing operation of said sewing needle.

4,070,976
UPPER THREAD TAKE-UP LEVERS FOR SEWING MACHINES

Bunsaku Taketomi, 56-141 Ishikane, Iwasaki, Nisshin-cho, Aichi, Aichi, Japan

Filed Feb. 1, 1977, Ser. No. 764,538
Int. Cl.² D05B 49/00
U.S. Cl. 112—241 **16 Claims**

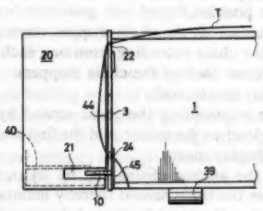


1. In an upper thread take-up lever for a two thread sewing machine, said lever having a free end, said machine having a frame carrying a vertically disposed thread guiding pulley rotatably supported thereon in the vicinity of a tension disc, the improvement which comprises:
upper thread guiding means vertically disposed above said pulley and rotatably supported adjacent to said free end of said lever; and
means secured to said free end of said lever for supporting said guiding means rotatably in unison with said pulley.

4,070,977
SEWING MACHINE

Kimihiko Yamamoto, Nagoya, and Hitoshi Ishikawa, Anjo, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Filed Nov. 2, 1976, Ser. No. 738,380
Int. Cl.² D05B 73/02
U.S. Cl. 112—259 **5 Claims**

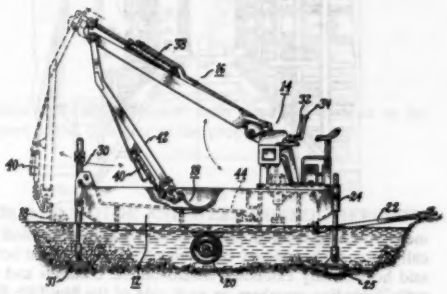


1. In a sewing machine comprising a base, a hollow arm extending from the base upright and then horizontally, a needle bar vertically reciprocating at the end portion of the arm and carrying at the end a thread carrying needle, a main driving shaft horizontally extending within said arm, a needle thread taking up lever having a slot type thread guiding eye at the free extremity thereof and being pivotable in a vertical plane parallel to the main driving shaft, a mechanism driven by the main shaft for reciprocating the needle bar and swivelling the needle thread taking up lever in synchronism with the reciprocation of the needle bar for taking up and slackening a loop of the needle thread passing through the slot type thread guiding eye, a cover attached to the end face of the arm for defining a housing in cooperation with the arm so as to nest the needle thread taking up lever in the housing, said cover having an upper side wall and a front side wall and having a small window in the upperside wall thereof elongated in parallel with the main driving shaft to permit the slot type thread guiding eye of the taking up lever to project outside of the cover, a separator means within the cover of sheet metal parallel to the front side wall of the cover to define as a partition wall in cooperation with a front side wall of the cover a space of a volume sufficient to allow the taking up lever to swivel therein but to control a ballooning of a portion of the needle thread passing through the guiding eye of the lever, and path means for the needle thread to travel unrevealedly with the cover.

4,070,978
FLOATING APPARATUS FOR WEEDING AND DREDGING WATERWAYS

Del P. Virgilio, 54 Greenings Ave., Pittsfield, Mass. 01201

Filed July 1, 1976, Ser. No. 701,758
Int. Cl.² B63B 35/28
U.S. Cl. 114—26 **2 Claims**



1. A floatable device for cleaning waterways comprising, in combination,
a. a barge member
1. said barge member having a container portion for receiving debris cleaned from a waterway,
b. an articulated boom member rotatably mounted on said barge member,
c. control means mounted on said barge for articulating and rotating said boom member,
d. an instrumentality mounted on the free end of said boom member for cleaning waterways,
1. said instrumentality moved with said boom member by said control means and also separately actuated by said control means,
e. stabilizer means mounted on said barge and movable to engage the bed of a waterway to prevent tipping of said barge when said boom member and said instrumentality are actuated to clean the waterway, and
f. said barge member in the form of a trailer movable from waterway to waterway.

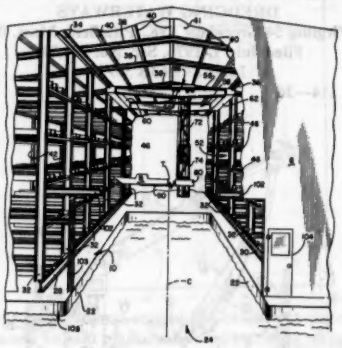
4,070,979
FLOATING DRY STORAGE FACILITY FOR SMALL BOATS

Roger W. Otis, and Stephen H. Otis, both of Box 518, McAlester, Okla. 74501

Filed Mar. 22, 1977, Ser. No. 780,236
Int. Cl.² B63B 35/44
U.S. Cl. 114—263 **9 Claims**

1. A floating dry storage facility for removing and storing boats of a maximum predetermined length in a building from a body of water comprising: a plurality of spaced horizontally disposed joists positioned transversely through the building; means connecting the joists to form a rectangular platform; a floor secured to said platform; flotation means positioned under each side of said platform to support said facility in the body of water; a pair of spaced parallel beams running longitudinally through the building, said beams being equally spaced from the longitudinal axis of the platform and aligned over the center of the flotation means; a plurality of spaced vertically extending columns spaced along and secured to each of said beams; roof truss means secured between the upper ends of said

columns; a pair of spaced parallel runway rails secured to said roof truss means adjacent the upper ends of said columns; a plurality of outer vertically extending members having a first end secured to said joists and a second end secured to said roof truss means, said outer vertically extending members being aligned with said columns on said beams; horizontally extending members secured in vertically spaced relationship and extending parallel to said beams, said horizontally extending



members being secured to each row of said columns and vertically extending members; boat support means secured between said horizontally extending means on the columns and vertically extending members on each side of the building; bridge means movably secured between the spaced parallel runway rails; lift means depending downwardly from said bridge means and adapted to raise and lower the boats; and means to cover said facility.

4,070,980

CHANNEL CONNECTOR FOR FLOATING DOCKS

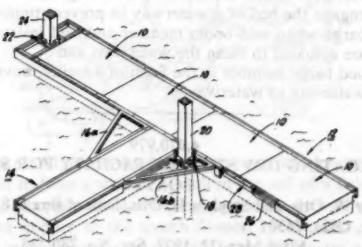
Myron L. Shorter, Jr., 81 Calypso Shores, Ignacio, Calif. 94947

Filed June 21, 1976, Ser. No. 697,832

The portion of the term of this patent subsequent to July 6, 1993, has been disclaimed.

Int. Cl.[2] B63B *35/44*

U.S. Cl. 114—263 **10 Claims**



1. In a float structure formed of a plurality of adjacently arranged interconnected float units, each float unit comprising an enclosed, substantially rectangular shell structure with opposed sides with sidewalls and ends with end walls, a top and a bottom, an improved means of interconnecting said float units, comprising; flange structures on said float units comprising a portion of said sidewalls horizontally projecting from said sidewalls and extending the length of said sidewalls, said flange structures having a horizontal top mounting surface a side and a horizontal bottom mounting surface spaced from said top surface; connection members for connecting at least two of said float units together with ends abutting, said connection members each comprising an elongated fabricated steel U-channel having an upper plate element mounted against said top mounting surface of said flange structures and a lower plate element mounted against said bottom mounting surface of said flange structures, and a spanning plate integrally connecting said upper and lower plates arranged at each side of said flange structures; said U-channel extending longitudinally along at least a portion of the flange structures of at least two adjacent float units; and fastening means extending through said U-channels and engaging said flange structures for securing said U-channels to at least said portions of said flange structures of said float units.

4,070,981

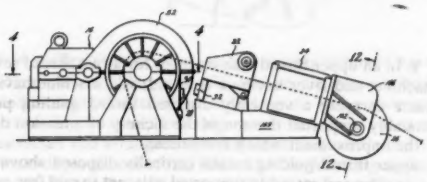
MOORING SYSTEM FOR FLOATING DRILLING VESSELS

David C. Guinn; Archie K. Haggard, and John P. Thomas, all of P. O. Box 1126, Houston, Tex. 77001

Filed Oct. 4, 1976, Ser. No. 729,496

Int. Cl.[2] B63B *21/50*

U.S. Cl. 114—293 **33 Claims**



1. A mooring system for maintaining a ship shape drilling vessel within alignment limits while drilling a well from the vessel in the sub-surface ground below it comprising,

a plurality of mooring chains, at least one extending from each side fore and aft of the vessel,

an anchor on each mooring chain for anchoring the anchor chain to the sub-surface ground,

a motor driven wildcat for each of the anchor chains,

means for sensing load on the motor while hauling in the anchor chain,

a brake including a brake band for braking each wildcat,

a first sensor on the brake band sensing load thereon,

a chain stopper for each anchor chain operable to lock the chain in position,

a second sensor on the chain stopper sensing load thereon,

each anchor chain extending from one each of the wildcats through one each of the chain stoppers,

load display means, and

means for transmitting the loads sensed by the means for sensing load on the motor, and the first and second sensors to the display means,

whereby the anchor chains can be let out and hauled in based on the loads sensed thereby maintaining the vessel within the alignment limits and the vessel can be warped into the sea.

30. The chain stopper of claim 29 where the chain stopper includes,

means to impact an end of the eccentric shaft to shift it axially.

4,070,982

CYLINDER-DRIVEN MARINE PROPULSION SYSTEM

James C. Willyard, 14204 Knotley Road, Silver Spring, Md. 20904

Division of Ser. No. 559,225, March 17, 1975, Pat. No. 3,978,814, which is a division of Ser. No. 376,334, July 5, 1973, Pat. No. 3,888,202. This application June 18, 1976, Ser. No. 697,469

Int. Cl.[2] B63H *11/02*

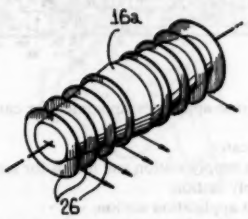
U.S. Cl. 115—16 **9 Claims**

1. In a marine vessel of the hull displacement type wherein the vessel hull is partially submerged when said vessel is in motion, a propulsion system comprising:

a flow duct extending along the bottom of said hull, said

duct being open at both ends and closed along its top, bottom and side walls, said duct being mostly submerged with the upper portion of its forward end extendng above the water line when said vessel is in motion;

a reaction device in the form of a driven cylinder located proximate the forward end of said duct and entirely within the confines of said hull, said cylinder having a longitudinal axis extending horizontally and perpendicular to the direction of vessel foward motion, the cylinder being positioned at a depth such that its periphery remains partially submerged during vessel motion, said cylinder having a plurality of spaced, thin annular members projecting from the cylinder periphery in vertical planes which are parallel to the direction of motion of said vessel, the cylinder periphery between said annular members comprising substantially smooth circumferential surfaces which are substantially devoid of projections therefrom, said cylinder being arranged to be rotatably driven in a first direc-



tion about its longitudinal axis such that said circumferential surfaces viscously force air and water under said cylinder and through said duct from forward of said vessel; and

means for selectively rotating said cylinder about said longitudinal axis in said first direction;

wherein said top wall of said duct extends rearwardly from a leading edge thereof, said leading being positioned adjacent said cylinder and below the top of said cylinder, said leading edge extending the length of said cylinder to direct water and air driven by said cylinder into said duct in a rearward flow direction;

wherein the bottom and side walls of said duct extend forwardly of said leading edge of said top wall and at least as far forward as the forwardmost portion of said cylinder;

whereby water and air driven rearwardly through said duct by said cylinder initiates a reactive force which drives said vessel in a forward direction without imparting a lift force to said vessel.

4,070,983

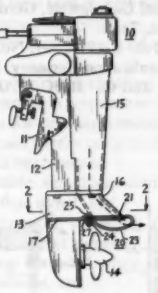
REVERSIBLE OUTBOARD MOTOR WITH EXHAUST GAS DISCHARGE CONTROL

Hubert E. Randall, Apt. F-12, New Rogers Road, Levittown, Pa. 19056

Filed Dec. 23, 1976, Ser. No. 753,646
Int. Cl.² B63H *5/13, 21/26*
U.S. Cl. 115—17 **5 Claims**

1. A marine propulsion device for an outboard motor having an exhaust gas delivery pipe, an anti-cavitation plate and a propeller below said plate which comprises

an exhaust gas diverter carried by cavitation plate and having a central inlet connected to the exhaust gas delivery pipe and, in direct communication with said inlet, opposite outwardly disposed horizontal tubular discharge passage-



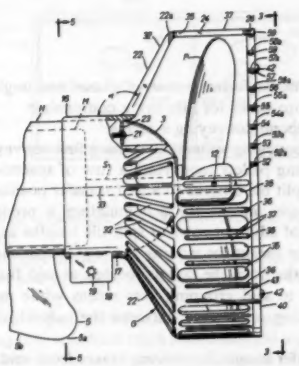
ways with their terminal ends separated at least as far apart as the diameter of the propeller.

4,070,984

OUTBOARD MOTOR AND WEED GUARD THEREFOR

Chris S. Kappas, 218 - 13th St., Racine, Wis. 53403

Filed July 25, 1977, Ser. No. 818,309
Int. Cl.² B63H *5/16*
U.S. Cl. 115—42 **11 Claims**

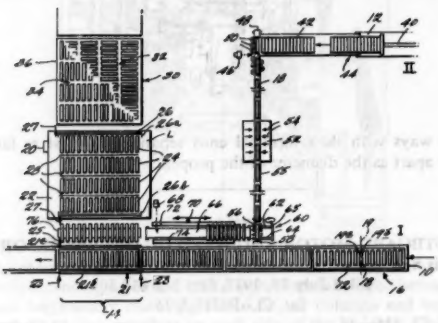


1. In combination with an outboard motor of the type having a horizontally elongated marine propeller drive housing and including a longitudinal front to rear axis, said housing having a front to rear extending shaft journalled therein and a marine propeller mounted on the rear end of said shaft, a weed guard mounted on said housing and surrounding and enclosing said propeller, said weed guard comprising a front end embracing said rear end of said housing for detachably securing said guard front end to said housing, said guard also including a rearwardly diverging tapered wall, said tapered wall comprising a series of radially extending spokes which are relatively thin in circumferential direction as compared to their front to rear width, whereby water can pass from a front to rear direction readily through said tapered wall, said guide also including a cylindrical portion integrally connected with said tapered wall and disposed radially outwardly from and surrounding said propeller and extending rearwardly past said propeller, said cylindrical portion being perforated to permit the passage of water readily therethrough; and a removable rear end plate attached to a rear end of said cylindrical portion and extending transversely behind said propeller, said plate being formed with a series of openings whereby said plate is substantially open to permit free passage of water therethrough.

4,070,985
AUTOMATIC PRODUCTION APPARATUS FOR MANUFACTURING OF SPLIT TILE

Hans Lingl, Neu-Ulm, Ludwigsfeld, Germany, assignor to Lingl Corporation, Paris, Tenn.

Filed Feb. 2, 1976, Ser. No. 654,168
Claims priority, application Germany, Mar. 1, 1975, 2508990
Int. Cl.[2] B65G *37/00*
U.S. Cl. 118—6 8 Claims



1. Apparatus for forming rows of glazed and unglazed split tile lengths into hacks for kiln firing comprising:

first and second conveying systems,

said first conveying system comprising first conveyor means for moving pallets supporting a row of spaced-apart unglazed split tile lengths to a first transfer position,

grouping area means for accumulating a predetermined number of adjacent rows of split tile lengths as a layer,

row transfer means for moving the row of spacedapart split tile lengths from the pallets located at said first transfer position to said grouping area means while maintaining the spacing established between the individual split tile lengths,

layer transfer means for moving layers from said grouping area means to a kiln car,

said second conveying system comprising

first, second and third conveyor means,

feeding means for feeding a palletized row of split tile lengths to said first conveyor means,

said second conveyor means being disposed perpendicularly to said first conveyor means and being adapted to individually receive split tile lengths therefrom in single file formation,

glazing means disposed on at least one side of said second conveyor means for glazing the split tile lengths passing therealong,

said third conveyor means being disposed perpendicularly to said second conveyor means and adapted to receive split tile lengths therefrom one at a time so as to form a row of spaced-apart split tile lengths on the third conveyor means, and

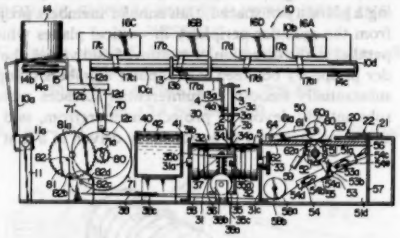
means for transferring thus formed rows to a second transfer position,

said row transfer means also being adapted to move a row of spaced-apart split tile lengths located at said second transfer position to said grouping area means while maintaining the spacing established between the individual split tile lengths.

4,070,986
AUTOMATIC BLOOD SERUM APPLICATOR APPARATUS FOR CATAPHORETIC USE

Yutaka Kato, Tama; Teruo Ouchi, Hachioji, and Kiyozo Koshiishi, Sagamihara, all of Japan, assignors to Olympus Optical Company, Ltd., Tokyo, Japan

Filed Sept. 18, 1975, Ser. No. 614,694
Claims priority, application Japan, Sept. 19, 1974, 49-108022
Int. Cl.[2] B05C *1/16*
U.S. Cl. 118—7 11 Claims



1. A blood serum applicator apparatus for cataphoretic use comprising:

a serum applicator;

a blood serum supply station and means for supplying blood at said supply station;

a blood serum application station;

a rinsing station at which said serum applicator is subjected to a rinsing fluid; means supplying rinsing fluid located at said rinsing station;

a dripping station including means for removing said rinsing fluid from said serum applicator;

a guide along which said serum applicator is moved to be sequentially passed through each of said stations;

a plurality of microswitches located at spaced intervals on said guide, each said microswitch for stopping the movement of said serum applicator when said serum applicator has reached a different one of said stations;

a cam assembly for causing a generally vertically downward and upward movement of said serum applicator when its movement is stopped by activation of one of said microswitches located on said guide; and

a station advancing control microswitch means mounted on said cam assembly, said control microswitch means being effective to cause movement of said serum applicator along said guide from one of said stations to the next, thus automatically achieving respective operations required for the application of the serum in succession.

4,070,987
EDGE COATING APPARATUS

William G. Gross, York; Henry A. Long, Jr., Columbia, and John R. Yamshak, Lancaster, all of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Nov. 18, 1976, Ser. No. 743,048
Int. Cl.[2] B05C *1/02*
U.S. Cl. 118—257 5 Claims

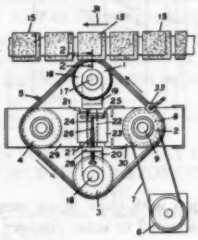
1. An edge-coating apparatus for simultaneously applying liquid coating material to adjacent non-parallel planar surfaces of the edge portions of work pieces, said apparatus comprising:

a. a flexible endless belt having an inner drive side and an outer liquid-transporting and applying side including

1. a first upper surface portion being outwardly and downwardly inclined in a plane different from the planes of the non-parallel planar edge surfaces of the work piece to be coated, an upper edge on said first surface portion of the belt, adapted to be in moving contact, at the point of application of the coating material, with a downwardly facing planar surface of the edge of the work piece being moved past said apparatus, a lower edge on

said first surface portion of the belt, adapted to lightly contact, at the point of liquid application, a planar surface on the edge of the work piece which is non-contiguous and non-parallel with said downwardly facing surface thereon, said first upper surface portion on the liquid-applying side of said belt being further adapted to apply coating material to at least two adjacent non-parallel planar surfaces of said work piece edge portion;

2. a second liquid-applying surface portion on said belt having a surface configuration substantially similar to that of a portion of the edge of a work piece to be coated thereby, said second surface portion extending from and being downwardly inclined with respect to said first surface portion; and
3. a substantially vertical surface portion on said belt



extending downwardly from said second surface portion,

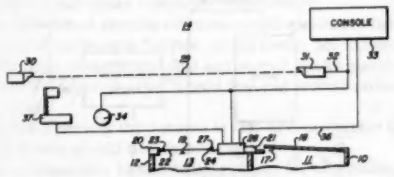
b. rotatable mounting means for said endless belt, said mounting means comprising a plurality of pulleys all mounted for rotation in the same horizontal plane;
c. means for imparting rotation to the mounting means;
d. means for supplying liquid to the liquid-applying side of said belt at a point preceding the point of liquid application;
e. means for bringing the edge portion of a work piece and the liquid-applying side of said belt into movable contact with each other; and
f. resilient means mounted for reciprocal movement in a horizontal plane for biasing said liquid-applying side of said belt into and maintaining its contact with the edge portion of a work piece being moved therepast.

4,070,988

STARTING APPARATUS FOR RODEO EVENTS

Arthur C. Smith, 3702 E. Meadowbrook Ave., Phoenix, Ariz. 85018

Division of Ser. No. 719,572, Sept. 1, 1976. This application June 6, 1977, Ser. No. 803,672
Int. Cl.[2] A63K *3/02*; A01K *1/00*
U.S. Cl. 119—15.5 A **3 Claims**



1. A starting system for use in combination with a rodeo structure, which structure includes a first stall for releasably retaining an animal and a second stall for detaining a contestant, and for initiating the activity of said contestant relative to movement of said animal from said first stall, said starting system comprising:

a. means for detecting the arrival of said animal at a predetermined distance from said second stall and for emitting a first signal in response thereto;
b. a releasable barrier for closing said second stall and including,
   i. latch means for detachably holding said barrier and for releasing said barrier in response to said first signal, and
   ii. switch means for emitting a second signal in response to release of said barrier prior to reception of said first signal by said latch means;
c. a first perceptible signalling device activated in response to said first signal; and
d. a second perceptible signalling device activated in response to said second signal,

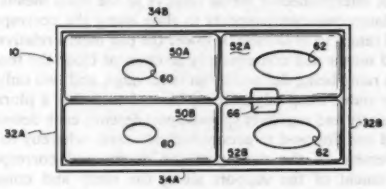
whereby said contestant is started when said animal arrives at said predetermined distance, and
whereby notification is given if said contestant starts before said animal arrives at said predetermined distance.

4,070,989

LARGE ANIMAL CONVALESCENT UNIT

David K. Ganzel, 1112 N. Hester St., Stillwater, Okla. 74074

Filed Aug. 16, 1976, Ser. No. 714,789
Int. Cl.[2] A61D *3/00*
U.S. Cl. 119—27 **8 Claims**



1. A large quadruped animal convalescent recovery stall, comprising:

a. an upright, opened top box of dimensions to receive the animal and of height at least greater than the legs of the animal;
b. closed, expandable flexible-walled, water tank means, having four reentrant tubes sealed into the top surface, the contour of each said tube being designed to fit one leg of said animal, said tank means fitting within said walls of said box, the height of the water tank means, when filled with water being greater than the length of the legs of the animal; and
c. means to fill said tank means with water after the animal's legs are positioned in said tubes whereby the water pressure in said tank means pressing on the surfaces of the legs and on the lower portions of the body of the animal supports the weight of the animal.

4,070,990

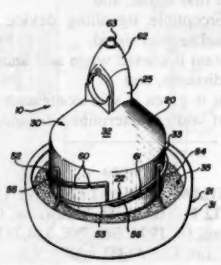
FEEDER PAN ASSEMBLY

Ray E. Swartzendruber, Syracuse, Ind., assignor to Chore-Time Equipment Inc., Milford, Ind.

Filed Feb. 2, 1976, Ser. No. 654,166
Int. Cl.[2] A01K *5/00*
U.S. Cl. 119—53 **1 Claim**

1. A feeder for poultry and the like, comprising pan means having an annular undercut lip portion and a pan bottom, hood means including feeder tube means adapted to receive feed from a source and direct it toward the pan means and shell means connected to the feeder tube means and extending to follow the contour of the pan means lip, and locatable at least partly within the pan means but spaced apart from the pan

means lip to define an annular feeding area accessible to the poultry, and also spaced apart from the pan bottom to define with the bottom a gate through which the feed must pass when traveling from the feeder tube to the annular feeding area, three inclined ramp members each unitarily formed with and projecting from the shell means, and an interconnector means including three strut members each adapted to extend down the shell means outer contours, across the interior contours of the pan, and thence upwardly into engagement with the pan means lip, and three angularly extended and inclined supports, each support being curved and inclined to lie upon the shell means ramp member with a line contact and secured to two adjacent struts at respective outer strut edges, and being vertically separated from both adjacent supports, whereby rotation of the interconnector means relative to the hood means causes the interconnector supports to slide along the corresponding shell ramps so as to raise or lower the pan means relative to the hood means and consequently to open or close the feed gate, each ramp being defined by an outer edge, and two only of the three outer ramp edges being formed to define a plurality of angularly and regularly spaced apart detents, each detent being sized and disposed to accommodate a strut whereby to inhibit movement of the strut past the detent and corresponding movement of the support along the ramp and consequent vertical movement of the pan relative to the hood and to permit said movement when the two interconnector struts are simultaneously moved out of engagement with the detents.



4,070,991

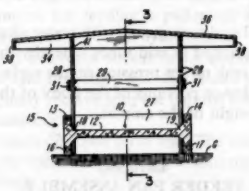
FEED BUNK STRUCTURE

Gregory Schmiesing, R.R. No. 1, New Bremen, Ohio 45869

Continuation of Ser. No. 554,187, Feb. 28, 1975, abandoned. This application May 28, 1976, Ser. No. 691,201

Int. Cl.[2] A01K *5/00*

U.S. Cl. 119—58 **19 Claims**



1. Feed bunk apparatus having an upper side and an under side, the upper side of which includes means defining a trough having a base feeding surface merging at its margins with upwardly projecting walls and the under side of which includes surface portions for seating thereof to a ground surface, post means including portions installed in said means defining a trough to one side of and immediately adjacent said upwardly projected walls, said post means being positioned and stabilized thereby to project upwardly from said base feeding surface, said installed portions of said post means being characterized by a slip fit mount in said means defining a trough and, upwardly of said installed portions thereof, said post means being adapted to mount a superstructure in an elevated relation to said trough.

4,070,992

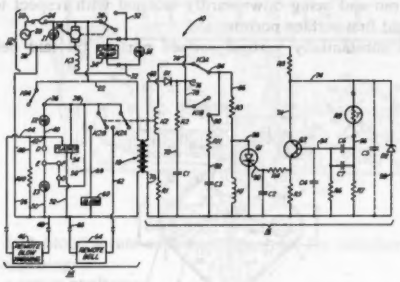
BOILER BLOW DOWN CONTROLLER

Donald Holdt, Cambridge, Md., assignor to Chemed Corporation, Cincinnati, Ohio

Filed Apr. 23, 1976, Ser. No. 679,696

Int. Cl.[2] F22B *37/54, 37/42*

U.S. Cl. 122—382 **18 Claims**



1. In combination with blow down means for a boiler, an electrical device adapted to sense changes in the fluid in said boiler blow down means being monitored and to produce an electrical signal in response to such temperature changes, circuit means adapted to receive said signal from said device, at least one alerting means, and said circuit means comprising means interconnecting said electrical device and said alerting means in such a manner that said alerting means are activated only when said temperature undergoes a predetermined relatively rapid change.

5. A method of producing an output signal in response to only a predetermined relatively rapid change in the temperature of a boiler blow down means, comprising the steps of of detecting said temperature, transducing the detected temperature into an electrical signal, inputting said signal to circuit means, selecting said circuit means such that its time constant is proportional to said predetermined relatively rapid change in said temperature, and producing an output signal from said circuit means in response to said predetermined relatively rapid change in said temperature.

4,070,993

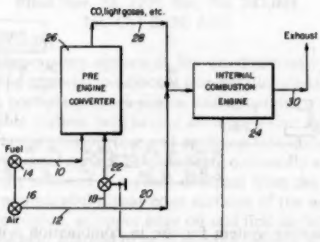
PRE-ENGINE CONVERTER

Nai Yuen Chen, Titusville, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 585,225, June 9, 1975, abandoned. This application Jan. 10, 1977, Ser. No. 758,249

Int. Cl.[2] F02M *25/06*

U.S. Cl. 123—3 **7 Claims**



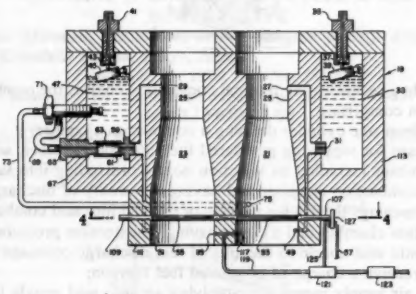
1. In the process of converting low octane normally liquid hydrocarbons to higher octane normally gaseous hydrocar-

bons by contacting said liquid hydrocarbons with a hydrocarbon cracking catalyst under cracking conditions, mixing the resulting gaseous hydrocarbon product with an oxygen-containing gas, and generating power by burning said gaseous hydrocarbon with said oxygen in an internal combustion engine; the improvement which comprises contacting said low octane normally liquid hydrocarbons with a controlled amount of an oxygen-containing gas in the presence of a hydrocarbon cracking catalyst, said controlled amount of said oxygen-containing gas being an amount sufficient to burn only a portion of said liquid hydrocarbons and provide a gaseous effluent comprising hydrocarbons of higher octane value than said normally liquid hydrocarbons, and said hydrocarbon cracking catalyst comprising a crystalline aluminosilicate zeolite having a silica to alumina ratio of at least 12, a constraint index of 1 to 12 and a crystal density not substantially below about 1.6 grams per cubic centimeter; mixing the resultant gaseous hydrocarbon effluent with an oxygen-containing gas in amount sufficient to burn said gaseous hydrocarbons; and passing the resulting mixture of gaseous hydrocarbons and oxygen-containing gas to said internal combustion engine.

4,070,994
MODIFICATION FOR SELECTIVELY OPERATING A FRACTION OF MULTIPLE ROTORS OF A ROTARY ENGINE

Arthur Garabedian, Fullerton, Calif., assignor to Dudley B. Frank, Santa Ana, Calif.

Filed Nov. 10, 1975, Ser. No. 630,383
Int. Cl.[2] F02B *53/06, 53/10*
U.S. Cl. 123—8.07 **9 Claims**



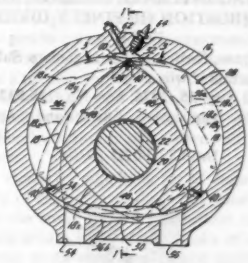
1. A rotary engine, comprising:
first and second combustion chambers;
first and second rotors mounted for rotation in said first and second combustion chambers, respectively;
first and second intake manifolds connected to said first and second combustion chambers, respectively, for supplying fuel and air to said combustion chambers;
first and second carburetor barrels connected to said first and second intake manifolds, respectively;
first and second throttle valves mounted within said first and second carburetor barrels, respectively, for controlling the flow of air to said first and second intake manifolds;
means for supplying fuel to said first and second carburetor barrels;
means for sensing the vacuum in said first carburetor barrel upstream of said first throttle valve;
means responsive to said sensing means for controlling said fuel supplying means to selectively prohibit fuel flow to said second carburetor barrel when the vacuum above the primary throttle valve is below a pre-selected amount;
means for monitoring the vacuum in said first intake manifold; and
means responsive to said monitoring means for controlling said second throttle valve in response to the vacuum in said first intake manifold.

8. An engine having first and second combustion chambers, each connected by independent intake manifolds to first and second carburetor barrels, said carburetor barrels each including a throttle valve, said engine comprising:
first sensing means for monitoring the vacuum downstream of a throttle valve within said first carburetor barrel;
second sensing means for monitoring the vacuum upstream of a throttle valve within said first carburetor barrel;
means for controlling said throttle valve of said second carburetor barrel in response to said first sensing means; and
means for selectively supplying fuel to said second carburetor barrel in response to said second sensing means.

4,070,995
ROTARY ENGINE WITH COMBUSTION GAS FLOW-BACK FOR DIESEL OPERATION

Robert W. Loyd, Jr., Wyckoff, N.J., assignor to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Filed June 11, 1976, Ser. No. 695,045
Int. Cl.[2] F02B *53/02*
U.S. Cl. 123—8.11 **4 Claims**



2. A rotary combustion diesel engine comprising:
a. an outer body having an internal cavity in which the peripheral surface of said cavity has a two-lobe profile and the two lobes are joined by two regions disposed relatively near to the axis of said cavity;
b. an inner body of generally triangular profile mounted for relative rotation within said outer body, the apex portions of said inner body having sealing cooperation with said two-lobe peripheral surface to define three working chambers which vary in volume in response to said relative rotation;
c. said outer body also having an intake port and an exhaust port for sequential communication with said working chambers and disposed adjacent to and on opposite sides of one of said near-axis regions such that as the engine operates each working chamber goes through a four-stroke cycle in which in the first stroke the chamber volume increases while in communication with the intake passage, in its second stroke the chamber approaches the other of said near-axis regions to decrease in volume and compress its air charge whereupon combustion takes place in said chamber adjacent to said other near-axis region, in its third stroke the chamber increases in volume as the combustion gases expand and in its fourth stroke the chamber decreases in volume while in communication with the exhaust passage to discharge its combustion gases, the volumetric compression ratio of each of said chambers being less than about 15:1 such that said compression ratio is less than that normally required for diesel operation;
d. means for discharging fuel into each working chamber after the air charge in said chamber has been substantially compressed; and
e. said outer body also having circumferentially extending

groove means in its two-lobe peripheral surface adjacent to said other near-axis region, said groove means being so positioned that an apex portion of the inner body does not reach the groove means until the working chamber on its trailing side has closed to the intake port and an apex portion of the inner body moves beyond said groove means before the working chamber on the leading side of said apex portion opens substantially to the exhaust port and said groove means having a flow cross-sectional area which is sufficiently large so that as an apex portion is passing over said groove means sufficient combustion gases flow back therethrough from the working chamber on the leading side of said apex portion into the following working chamber on the trailing side which then is in an initial portion of its compression stroke so as to raise the pressure and temperature of the charge in said following chamber to a point where the subsequent compression in said following chamber causes the pressure and temperature of its charge to reach magnitudes sufficient for self-ignition of the fuel discharged therein to provide diesel operation.

4,070,996

RECIPROCATING INTERNAL COMBUSTION ENGINE FOR THE COMBUSTION OF FINELY DIVIDED SOLID FUEL

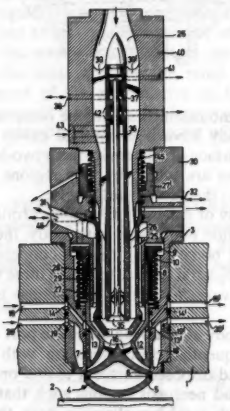
Anton Steiger, Illnau, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Aug. 18, 1976, Ser. No. 715,532

Claims priority, application Switzerland, Apr. 7, 1976, 4354/76

Int. Cl.² F02D *19/04*

U.S. Cl. 123—23 **24 Claims**



1. In a reciprocating internal combustion engine having a combustion chamber for the combustion of finely divided solid fuel, the combination comprising

means for forming a suspension of solid fuel particles and air,

a valve piston for cyclically expelling solid fuel particles into said combustion chamber of the engine from a powdered coal collector disposed in said valve piston and adjacent said combustion chamber;

a channel extending between said means and said collector along a straight vertical longitudinal axis to deliver the fuel/air suspension to said collector;

a tube within a central and lower region of said channel to form said channel into an annular shape thereat; and

an air valve disposed in said channel above said collector and coaxially within said tube for cyclically charging air into said collector to expel the fuel particles in said collector into said combustion chamber through said valve piston, said air valve having a seating surface sealingly seating on a lower end of said tube.

4,070,997

RECIPROCATING INTERNAL COMBUSTION ENGINE USING POWDERED SOLID FUEL

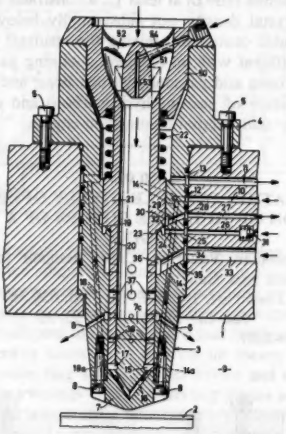
Anton Steiger, Illnau, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Aug. 30, 1976, Ser. No. 718,516

Claims priority, application Switzerland, Mar. 5, 1976, 2752/76

Int. Cl.² F02D *19/04*

U.S. Cl. 123—23 **16 Claims**



1. In a reciprocating internal combustion engine, the combination comprising

at least one cylinder defining a combustion chamber;

means for supplying powdered fuel into said chamber, said means including an injection nozzle protruding into said combustion chamber and having a plurality of discharge openings therein for passage of the fuel into said combustion chamber and a cover having an extension projecting into said nozzle to the area of said discharge openings to receive a charge of powdered fuel thereon;

an air supply means for supplying air into said nozzle for passage through said discharge openings;

a hollow slider mounted in said nozzle for movement between a first position to establish a connection between said air supply means and said discharge openings to permit injection of a charge of powdered fuel on said extension into said combustion chamber and a second position blocking said connection; and

a dosing means in communication with said hollow slider for supplying a charge of powdered fuel into said nozzle and onto said extension.

4,070,998

COMPRESSION IGNITION CONTROL PRESSURE HEAT ENGINE

Harlow B. Grow, 16530 Chattanooga Place, Pacific Palisades, Calif. 90272

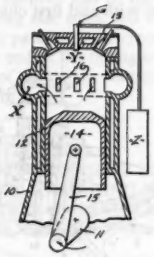
Filed Oct. 24, 1975, Ser. No. 625,676

Int. Cl.² F02B *41/00*

U.S. Cl. 123—26 **6 Claims**

1. A compression ignition and controlled diminishing pressure cycle heat engine wherein a piston reciprocates in a cylinder and is acted upon by the expansion of burning fuel to perform work, and including; drive means coupled to the piston for reciprocation of said piston in the cylinder between

bottom and top dead center positions, a port opening into the cylinder intermediate the top and bottom dead center positions of said piston and adapted to be opened and closed by downward and upward movement of said piston respectively, a closed storage chamber in open communication with the port for the exit and re-entry of gases from and into the cylinder, the port being positioned for closure by the piston and the entrappment of gases in the said storage chamber at combustion sup-



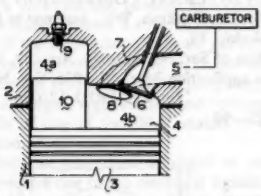
porting pressure, an auto ignition chamber of minimized volume between said port and a head closing the top end of the cylinder for compression of gases to ignition temperature, and a full stroke fuel pump means injecting fuel into the cylinder from the top position of the piston and substantially throughout its effective work stroke, said port being opened by the piston for re-entry of gases from said storage chamber for support of continued combustion of fuel.

4,070,999

GASOLINE ENGINE OF FOUR-CYCLE SPARK IGNITION TYPE

Isao Matsuno, Tachikawa, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 31, 1975, Ser. No. 563,823
Claims priority, application Japan, Apr. 3, 1974, 49-37716
Int. Cl.[2] F02B *23/08*
U.S. Cl. 123—32 B **7 Claims**



1. A method of operating a gasoline-powered internal combustion engine having a combustion chamber, comprising the steps of

supplying for all engine loads over the full range of engine operation a homogeneous air-fuel mixture into the entire combustion chamber through an intake means in an intake stroke before a separation of the combustion chamber,

subsequently separating the combustion chamber into temporarily non-communicating first and second combustion spaces near a top dead center for a range starting and ending, respectively within a crank angle 10° to 30° before and after the top dead center, and

igniting air-fuel mixture in one of the combustion spaces by spark plug means located in said combustion chamber initiating combustion of the air-fuel mixture in one of the combustion spaces when said first and second combustion spaces are non-communicatingly separated,

subsequently communicating said first and second combustion spaces with each other at an initial stage of the expansion stroke of a piston causing flame propogation from said one of said combustion spaces into the air-fuel mixture in the other of said combustion spaces at a delayed time instant for igniting the air-fuel mixture in the second combustion space by the flame from the first ignited combustion space to cause divisional combustion to occur to decrease maximum combustion temperature.

2. A gasoline-powered internal combustion engine of four cycle type, comprising

a cylinder including a cylinder head having an inner wall defining a pocket,

intake means and exhaust means for said cylinder, said intake means including a carburetor, an intake part and an intake valve operatively connected to one another,

main piston means disposed for reciprocal operation in said cylinder,

auxiliary piston means projecting from said main piston means and disposed for reciprocal operation into said pocket for non-communicatingly separating the pocket,

said cylinder head defining a combustion chamber between said cylinder head and said main piston means, said combustion chamber being divided into non-communicatingly separated first and second combustion spaces, respectively, which are defined between said main piston means and said cylinder head, and between said inner wall of said pocket and said auxiliary piston means, respectively, when said auxiliary piston means is in said pocket, and said auxiliary piston means for non-communicatingly separating said first and second combustion spaces from each other for a predetermined time period starting and ending respectively when said main piston means is within 10°–30° before and after a top dead center of a piston stroke thereby forming an independent second combustion space,

said intake means for supplying for all engine loads over the full range of engine operation homogeneous air-fuel mixture into the entire of said combustion chamber through said intake means in an intake stroke of said main piston means prior to the separation of said combustion chamber into said first and second combustion spaces,

spark plug means disposed in said combustion chamber for initiating combustion of the air-fuel mixture in one of said non-communicatingly separated combustion spaces when said first and second combustion spaces are non-communicatingly separated when said auxiliary piston means is in said pocket, said auxiliary piston means for subsequently communicating said first and second combustion spaces with each other at an initial stage of an expansion stroke to permit flame propogation from said one of said combustion spaces into the air-fuel mixture in the other of said combustion spaces at a delayed time instant,

whereby homogeneous air-fuel mixture is introduced into said combustion chamber before separation of said combustion chamber and whereby the mixture of said one of said combustion spaces is ignited by said spark plug means during the predetermined time period of separation of said combustion chamber and the mixture in the other combustion space is burned thereafter by the flame from the ignited said one combustion space causing divisional combustion to decrease a maximum combustion temperature.

4,071,000

DOUBLE CRANKSHAFT VALVED TWO CYCLE ENGINE

Chester L. Herbert, 17972 Athens Ave., Villa Park, Calif. 92667

Continuation of Ser. No. 589,194, June 23, 1975, abandoned.
This application Dec. 10, 1976, Ser. No. 749,501
Int. Cl.[2] F02B *25/10*
U.S. Cl. 123—51 BD **9 Claims**

1. A two cycle internal combustion engine having a power stroke on each rotation of the crankshaft, comprising:

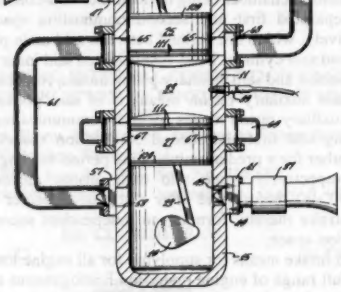
a cylinder open at both ends and including a plurality of intake ports passing through the cylindrical wall of said cylinder at one end and a plurality of exhaust ports passing

through the cylindrical wall of said cylinder at the other end;

a pair of crankcases connected at opposite ends of said cylinder, each of said crankcases including inlet and output ports;

a pair of crankshafts mounted in said pair of crankcases;

a pair of pistons each having a skirt and each connected to one of said crankshafts for reciprocation in opposite ends of said cylinder, the skirt of one of said pistons periodically covering and uncovering said cylinder intake ports and thereby opening and closing said intake ports to said cylinder during said reciprocation and the other of said pistons periodically covering and uncovering said cylinder exhaust ports and thereby opening and closing said exhaust ports to said cylinder during said reciprocation;



means for connecting both of said crankshafts to a single output shaft to produce output power;

means for conducting a mixture of fuel and air to said inlet ports of each of said crankcases;

a manifold connected exclusively to said outlet ports of both of said crankcases and to said plural intake ports of said cylinder;

a high speed valve mounted on each of said crankcases to periodically open and close said inlet ports of each of said crankcases; and

high speed valve means for preventing detonation of fuel contained in said crankcases, said means mounted on each of said crankcases to periodically open and close said outlet ports of each of said crankcases.

4,071,001

STRATIFIED COMBUSTION ENGINE WITH PRECHAMBER

Kenji Goto, Shizuoka, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed May 28, 1975, Ser. No. 581,528

Claims priority, application Japan, Oct. 3, 1974, 49-37170

Int. Cl.[2] F02B *19/10*

U.S. Cl. 123—75 B **9 Claims**

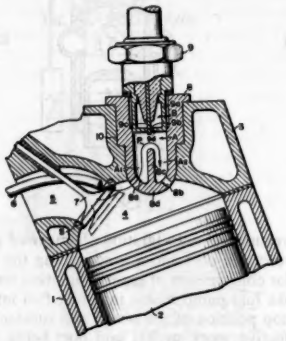
1. In an improved stratified combustion engine of the type including a main combustion chamber defined by a cylinder head and a piston head, a main suction passage supplying a lean mixture into the main combustion chamber, a precombustion chamber having a discharge electrode therein and communicating with the main combustion chamber, a supply conduit in the main suction passage for directing a rich mixture to the precombustion chamber through the main combustion chamber, and an inlet valve common to the main suction passage and to the supply conduit, the improvement comprising:

a first chamber formed in the precombustion chamber,

a first passage communicating said first chamber with said main combustion chamber for introducing a flow of the rich mixture deflected from the back face of the inlet valve into said first chamber upon opening of said inlet valve,

a second passage communicating said first chamber with the main combustion chamber for scavenging a burnt gas retained in said first chamber into a portion of the main chamber remote from said inlet valve upon opening of the inlet valve,

a second chamber arranged in the precombustion chamber in axial alignment with said first chamber,



a partition dividing said first chamber from said second chamber,

an orifice formed in said partition and communicating said first chamber with said second chamber, said orifice being of sufficient size to permit at least a portion of the fuel-air mixture in said first chamber to be transferred to said second chamber during the compression state of the piston, and

said discharge electrode being disposed in said second chamber and extending into said orifice.

4,071,002

THROTTLE AND IGNITION ADVANCE LINKAGE FOR AN INTERNAL COMBUSTION ENGINE

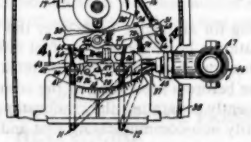
James H. Frahm, Oshkosh, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Continuation of Ser. No. 501,656, Aug. 29, 1974, abandoned.

This application Mar. 18, 1976, Ser. No. 668,137

Int. Cl.[2] F02D *37/00*

U.S. Cl. 123—99 **19 Claims**



1. A throttle control apparatus having a movable throttle setting element, comprising a common pivot pin, a throttle control lever pivotally mounted on the pin and having a minimum throttle position and movable to an advanced throttle position, a timing control lever pivotally mounted on the pin, a drive means coupled to the throttle control lever for pivoting the control lever, resilient means coupling the levers for moving the timing control lever with the throttle control lever, and

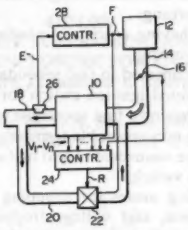
a lost motion coupling means connected to the throttle control lever and to the throttle setting element for moving the throttle setting element only after a selected initial movement of the throttle control lever and the timing control lever prior to movement of the throttle control lever into engagement with the throttle setting element and wherein said throttle control lever is a T-shaped member having a cross-bar and stem, said lost motion coupling means including an adjustable cam member and releasable attachment means adjustably secured to the stem of said T-shaped member and to the cam member for selective positioning along said stem, and said timing control lever extended generally parallel to the cross-bar, said resilient means coupling the one end of the timing control lever to the stem, the opposite end of the timing control lever including a pivotally mounted timing link.

4,071,003

CONTROL SYSTEM FOR ENGINE EXHAUST GAS RECIRCULATION ACCORDING TO ENGINE OPERATIONAL CONDITION

Shigeo Aono, Seki, Japan, assignor to Nissan Motor Co., Ltd., Japan

Filed Aug. 4, 1976, Ser. No. 711,521
Claims priority, application Japan, Aug. 5, 1975, 50-94747
Int. Cl.² F02M *25/06*
U.S. Cl. 123—119 A **12 Claims**



1. In an internal combustion engine provided with a throttle valve in the intake system and an exhaust gas recirculation system for recirculating a portion of the exhaust gas to the engine including a recirculation passage interconnecting the exhaust line to the intake system, a control system for controlling the quantity of the recirculated exhaust gas comprising:

a flow control valve provided in the recirculation passage;

at least two different sensor means for producing individually an electrical signal representing and corresponding to the magnitude of one of variables related to the operational condition of the engine;

at least two function generators arranged to individually receive a respective one of the electrical signals produced by said at least two sensor means and individually produce an output signal corresponding to a desirable opening degree of said flow control valve based on the assigned electrical signal;

an arithmetic operation circuit connected to said at least two function generators to modulate respectively in amplitude the outputs of the two function generators according to the respective and relative importance of said variables to the control of the opening degree of said flow control valve and means to produce from the two modulated outputs a control signal;

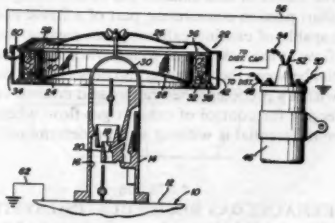
valve-actuating means for varying the opening degree of said flow control valve in response to said control signal, said arithmetic operation circuit comprising at least two multipliers respectively connected to said at least two function generators to individually multiply the output signal produced by the assigned function generator by a constant, an adder for producing an output signal by adding up all the outputs of said at least two multipliers except for a definite output and another multiplier arranged to produce said control signal by multiplying said output signal of said adder by said definite output, and the function generator connected to the multiplier which provides said definite output being assigned to a definite one of said variables having a great importance to the control of the opening degree of said flow control valve.

4,071,004

ELECTRO-STATIC FUEL MIXTURE SYSTEM

Neil A. Ostergaard, 3830 S. 43rd St., Apt. 10, Milwaukee, Wis. 53220

Filed Jan. 8, 1976, Ser. No. 647,638
Int. Cl.² F02M *27/04*
U.S. Cl. 123—119 E **6 Claims**



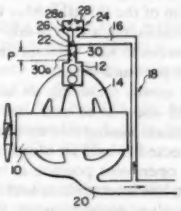
1. In combination with a combustion engine of the type including induction passage for air and fuel including air filtering means operatively associated with its inlet end and fuel inlet means for admitting fuel into said induction passage downstream from said air filtering means intermediate the inlet end of the induction passage and the outlet end thereof opening into said engine, foraminous panel means constructed of conductive material insulatively supported from said air filtering means and disposed for passage of at least substantially all of the air passing through said air filtering means through said foraminous panel means, said fuel inlet means including at least a fuel discharging portion thereof constructed of conductive material, and high voltage, low amperage current source means electrically connected to said foraminous panel means and grounded relative to said fuel inlet means fuel discharging portion.

4,071,005

INTERNAL COMBUSTION ENGINE EQUIPPED WITH IMPROVED EXHAUST GAS RECIRCULATION SYSTEM

Yasuo Nakajima, Yokosuka, and Yoshimasa Hayashi, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Aug. 6, 1976, Ser. No. 712,279
Claims priority, application Japan, Aug. 12, 1975, 50-97138
Int. Cl.² F02M *25/06*
U.S. Cl. 123—119 A **9 Claims**



1. An internal combustion engine having a combustion chamber therein, comprising:

an intake system including an intake passage for passing therethrough at least air to the combustion chamber of the engine;

an exhaust system including an exhaust passage for passing therethrough the exhaust gases discharged from the combustion chamber;

exhaust gas recirculating means for recirculating a portion of the exhaust gases passing through the exhaust system into the combustion chamber through the intake system, said exhaust gas recirculating means including conduit means connecting the intake system and the exhaust system, and control valve means disposed in said conduit means for controlling the amount of the exhaust gases passing therethrough by varying the opening degree of said control valve means in response to an engine operating parameter; and

a constant area venturi portion disposed within a portion of said conduit means and spaced apart from said control valve means of said exhaust gas recirculating means, said venturi portion constituting part of a Laval nozzle which is capable of causing exhaust gases passing therethrough to flow at the velocity of sound when the pressure differential between the upstream and downstream sides thereof is within a predetermined range, said control valve means effective for control of exhaust gas flow when said pressure differential is without said predetermined range.

4,071,006

EXHAUST GAS RECIRCULATING SYSTEM

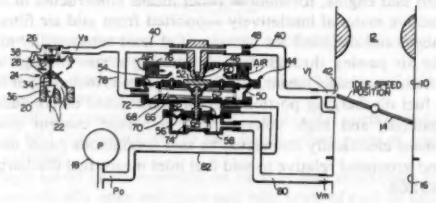
Ietsuya Harada, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Aug. 11, 1976, Ser. No. 713,617

Claims priority, application Japan, Aug. 12, 1975, 50-110532; Nov. 8, 1975, 50-152780; Nov. 8, 1975, 50-152779

Int. Cl.[2] F02M *25/06*

U.S. Cl. 123—119 A **19 Claims**



1. In an internal combustion engine having an intake system with a throttle valve and an exhaust system,

an exhaust gas recirculating system comprising:

an EGR duct connecting the exhaust gases passing through the exhaust system to the intake system;

an EGR valve normally closing said EGR duct to prevent recirculation and movable by a signal vacuum applied thereto to an open position;

control means operable to provide a signal vacuum to said EGR valve including a vacuum line connecting a vacuum port communicating with the intake system above the idle speed position of the throttle valve to said EGR valve; air bleed means including a vent in said vacuum line; and flow restricting means in said vacuum line fluidly intermediate said vacuum port and vent;

said air bleed means including an air bleed control valve movable into and out of said vent to close or open the same; first means biasing said air bleed valve closed; servo means connected to said air bleed control valve for moving it to an open vent position in response to vacuum in said vacuum line intermediate said flow restricting means and EGR valve; second means for biasing said servo means in response to the engine manifold vacuum in a direction to move said air bleed control valve to an open vent position; and third means for biasing said second biasing means to vary movement of said air bleed control valve to an open vent position.

4,071,007

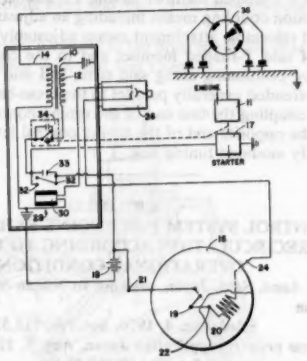
STOP AUTO THEFT

Robert J. Arix, 3rd P.O. Box 343, Racine, Ohio 45771

Filed Aug. 24, 1976, Ser. No. 717,269

Int. Cl.[2] H02G *3/00*; B60R *25/00*

U.S. Cl. 123—146.5 B **2 Claims**



1. An anti-theft device in combination with motor vehicle having an internal combustion engine and an ignition system, said device comprising:

a transformer having a primary winding and a stepped-up secondary winding;

a distributor connected to said secondary winding;

a starter-connected ignition switch for starting the engine, said switch having a first accessible terminal and a second substantially non-accessible terminal;

a voltage source connected to said first accessible terminal of said ignition switch;

voltage-dropping means for dropping the voltage of said voltage source, said voltage-dropping means having a third substantially non-accessible terminal connected to said second terminal, and a fourth accessible terminal;

a circuit breaker connected to said fourth accessible terminal of ignition switch and set to trip at a predetermined current;

a relay having a coil connected to, and energizable by said ignition switch through said circuit breaker, and at least a pair of contacts closable by operating said ignition switch, one of said contacts being connected to said voltage source, said coil being designed to burn out at a curren' just exceeding said predetermined current, said ignition switch, said voltage dropping means, said circuit breaker and said relay being connected in series across said voltage source; and

periodically openable contact means actuable by closure of said pair of contacts, the latter, said contact means, and said voltage source being connected in series with said primary winding, whereby said circuit breaker trips upon a thief shorting said accessible terminals and the relay coil burns out upon the thief shorting said circuit breaker comma thus preventing the closure of said pair of contacts and actuation of said periodically openable contact means.

4,071,008

LOW-NOISE-LEVEL INTERNAL COMBUSTION ENGINE

Othmar Skatsche; Gerhard Thien, and Heinz Fachbach, all of Graz, Austria, assignors to Hans List, Graz, Austria

Filed Apr. 15, 1976, Ser. No. 677,251

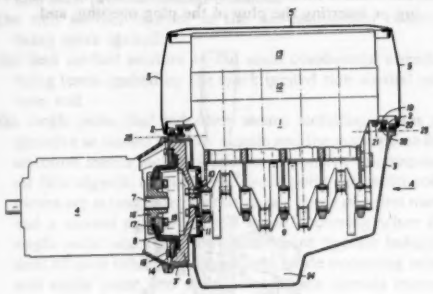
Claims priority, application Austria, Apr. 18, 1975, 3026/75

Int. Cl.[2] F02B *77/00*

U.S. Cl. 123—198 E **15 Claims**

1. A low-noise-level internal combustion engine comprising a crankshaft and crankshaft main bearings which are engine

parts directly affected by body resonance and sound vibration, an engine unit support which supports said crankshaft main bearings, a cylinder head mounted on said engine unit support, auxiliary units rigidly connected to the engine unit support and



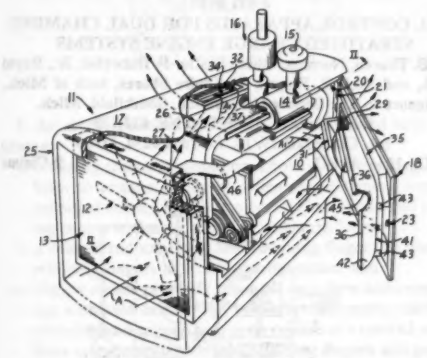
to the cylinder head, and further comprising a crankcase and a flywheel case connected with the crankcase, and at least one resonance-absorbing member located above the crankshaft between said engine parts which are directly affected by sound vibration and said crankcase and flywheel case.

4,071,009

COMBINED NOISE SUPPRESSING AND AIR FLOW GUIDE ENCLOSURE FOR ENGINES

Jack H. Kraina, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed June 28, 1976, Ser. No. 700,274
Int. Cl.² F02B 77/00; F01P 1/02
U.S. Cl. 123—198 E **19 Claims**



1. A combined noise suppressing and airflow guide enclosure mounted on a vehicle in substantial surrounding relationship about an engine thereof, an inlet having a radiator disposed therein forwardly of said engine and a fan rotatably mounted between said engine and said radiator for drawing air into said enclosure, said enclosure comprising

outer enclosure means substantially surrounding said engine comprising a horizontally disposed hood positioned over a top of said engine and a pair of vertically disposed sidewalls positioned on either side of said engine, each of said sidewalls comprising a door movably mounted on said enclosure for exposing said engine directly and having a layer of sound-absorbing material secured internally thereon,

inner enclosure means disposed in substantial isolated relationship within said outer enclosure means comprising a horizontally disposed upper wall comprising a layer of sound-absorbing material and positioned in vertically spaced relationship between said hood and the top of said engine to define a first airflow passage between said hood and said upper wall and to further define, along with said sidewalls, a second airflow passage about the top and sides of said engine and

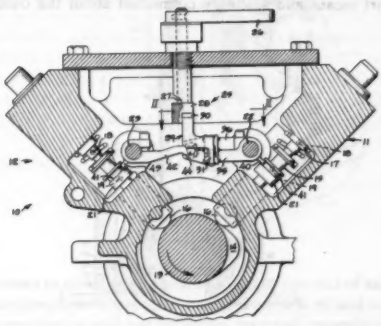
airflow guide means secured internally on each of said doors to define a passage therebetween communicating air from said radiator to said second airflow passage.

4,071,010

ENGINE START-UP SYSTEM AND METHOD

Robert H. Miller, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed July 19, 1976, Ser. No. 706,714
Int. Cl.² F02M 63/02
U.S. Cl. 123—198 F **22 Claims**



1. In combination with an internal combustion engine comprising a sleeve metering fuel system including first and second banks of pumps, a housing at least substantially filled with liquid diesel fuel, a cam shaft rotatably mounted in said housing, a master control shaft rockably mounted in said housing and a plurality of control levers secured on said master control shaft, each of said pumps comprising a plunger reciprocally mounted in said housing and engageable with said cam shaft for reciprocation thereby, a pair of axially spaced fill and spill ports formed in said plunger, a barrel mounted in said housing and having an upper end of said plunger reciprocally mounted therein and positioned to alternately cover and uncover said fill port upon reciprocation of said plunger and a sleeve reciprocally mounted on a lower end of said plunger for alternately covering and uncovering said spill port, each of said control levers engaged with the sleeve of each pump of said second bank of pumps, lock-out means for selectively permitting (1) communication of fuel through only said second bank of pumps, or (2) communication of fuel through each of said first and second banks of pumps.

4,071,011

PORT CLOSURE APPARATUS FOR DIFFERENTIALLY PRESSURED VESSELS

Donald H. Oertle, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Continuation-in-part of Ser. No. 556,254, March 7, 1975, abandoned. This application Dec. 9, 1976, Ser. No. 749,189
Int. Cl.² F16K 1/02
U.S. Cl. 137—317 **2 Claims**

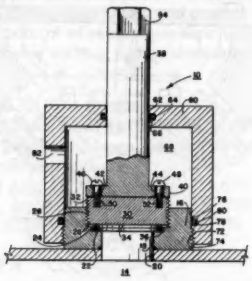
1. A low profile device for sealing a differentially pressured vessel having an entry port, comprising:

low profile port means having a central passage therethrough and being secured to the vessel with the central passage in axial alignment with the entry port by non-protrudable means, the low profile port means comprising a cylindrical ring means including a circumferentially outer

and (with respect to the vessel) inner threaded portion protected by a (with respect to the vessel) outer shoulder and a circumferentially inner and (with respect to the vessel) outer threaded bore of greater diameter and outer of an annular sealing surface surrounding the central passage; and a sealing ring seat on the annular sealing surface;

low profile sealing plug means the sealing plug means comprising a cylindrical plug having circumferentially outer threads for engagement with the cylindrical ring means in the circumferentially inner threaded bore, and having an inner (with respect to the vessel) flat end surface for sealing contact with the sealing ring means in bearing upon the annular sealing surface, insertable within the central passage in pressure-tight sealing connection between the annular sealing surface and the sealing plug means;

manifold means disposed over the sealing plug means and port means and sealingly connected about the outer pe-



riphery of the port means having an inner circumferential threaded portion and providing sealed fit over the port means;

access means formed through the manifold means to enable selective fluid communication between the exterior and interior of the manifold means; and

stem means sealingly disposed through the manifold means in rotatable realtionship for rotatable affixture to the plug means thereby to enable manipulation of the plug means into and out of sealing connection within the central passage of the port means;

further characterized that;

manipulation of the plug means by means of the stem means into sealing connection within the central passage of the port means seals the differentially pressured vessel to enable removal of the manifold means and stem means thereby to reveal a low profile seal of the differentially-pressured vessel.

4,071,012

FLUID FILL OR BLEED APPARATUS

Gordon R. Cooke, San Diego, Calif., assignor to United States of America as represented by the Secretary of the Navy

Filed Apr. 23, 1976, Ser. No. 680,013
Int. Cl. F16k *43/00*
U.S. Cl. 137—321 **6 Claims**

1. An apparatus for filling or bleeding fluid out of a container comprising:

a plug threaded in the container;

said plug having a longitudinal passageway which opens through the bottom of the plug and a lateral passageway which opens through the side of the plug so that the plug will close the container when fully inserted therein and will open the container when partially withdrawn therefrom;

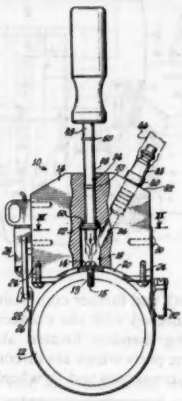
a block which has a cavity;

means for sealably attaching the block to the container so that the cavity is sealed about the plug in a spaced relationship so as not to touch the plug;

said block having a pair of passageways which extend outwardly from the cavity to respective spaced apart ports;

a fitting connected in the port of one of the passageways for filling or bleeding fluid through the plug opening;

means slidable through the other passageway for withdrawing or inserting the plug in the plug opening; and



means for sealing the withdrawing or inserting means to said other passageway,

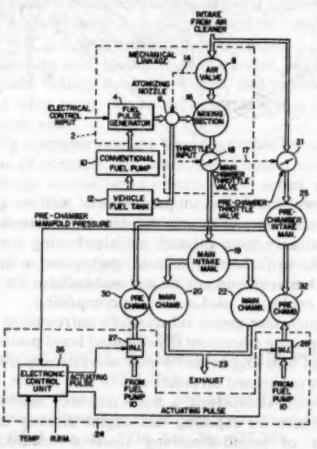
whereby a seal of the container is maintained while (1) the plug is partially withdrawn, (2) fluid is inserted in or bled from the container through the longitudinal and lateral passageways of the plug and (3) the plug is fully inserted in the plug opening to close off the container.

4,071,013

FUEL CONTROL APPARATUS FOR DUAL CHAMBER STRATIFIED CHARGE ENGINE SYSTEMS

John B. Thuren, Norman, Okla.; Walter F. Datwyler, Jr., Royal Oak, and Jack R. Phipps, St. Claire Shores, both of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed Nov. 18, 1975, Ser. No. 633,138
Int. Cl.[2] F02B *19/10, 19/16;* F02M *13/06*
U.S. Cl. 123—32 SP **9 Claims**



1. Fuel control apparatus for dual chamber stratified charge internal combustion engines, wherein each of the cylinders of the engine includes a pre-combustion chamber connected with a main combustion chamber, comprising in combination:

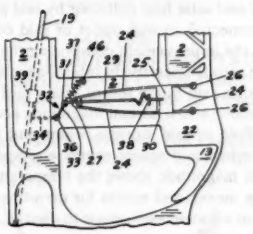
single point fuel induction means for introducing a lean air-fuel mixture into the main combustion chambers;
multi-point fuel injection means for providing timed pulses of appropriate duration for injecting a rich air-fuel mixture into each pre-combustion chamber;
the rich air-fuel mixture in the pre-combustion chamber being spark ignited;
the lean air-fuel mixture in the main combustion chamber being torch ignited by the spark ignited rich air-fuel mixture; and
the single point fuel induction means including means responsive to sensed air flow signals and the multi-point fuel injection means including means responsive to computed air flow signals, whereby the single point and multi-point means are arranged to operate in one mode of a first mode and a second mode, the first mode occurring when the single point and the multi-point means operate independent of each other and the second mode occurring when said single point and multi-point means operate interrelated to each other.

4,071,014

ARROW POSITIONING DEVICE

George H. Trotter, 7107 Janey St., Shreveport, La. 71108

Filed Mar. 7, 1977, Ser. No. 775,418
Int. Cl.[2] F41B 5/00
U.S. Cl. 124—41 A 10 Claims



1. An arrow positioning device for a compound bow comprising:
a. retaining means mounted on a bow and projecting therefrom to engage an arrow when said retaining means is extended when a bow is in a cocked condition; said retaining means including a pair of retaining fingers;
b. a release rod engaging said retaining fingers to bias said retaining fingers in a cock configuration; and
c. trigger means pivotally mounted on a bow and cooperating with said release rod and a synchronizing cable for releasing said release rod, upon release of a cocked arrow, from engagement with said retaining fingers and permitting said retaining fingers to retract from contact under bias action with an arrow.

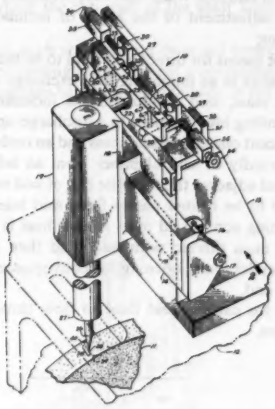
4,071,015

WHEEL DRESSING DEVICE

Manfred Maximilian Funke, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Apr. 15, 1977, Ser. No. 788,065
Int. Cl.[2] B24B 53/08
U.S. Cl. 125—11 AT 4 Claims

1. An improved wheel dressing device for generating a locus of curvature from a set of dressing parameters which include:
a. a pair of base-carried supports;
b. an angled cam bar biased against said supports;
c. a pivot point on said cam bar;
d. means to traverse said cam bar and pivot point in a first direction across said supports and the reverse, wherein the cam bar attitude varys so as to move said pivot point simultaneously in a second direction normal to said first direction; and
e. a dressing stylus depending from said pivot point so as to trace out a locus of curvature in accordance with first and second directional components; wherein the improvement comprises:
f. means to bias said supports to a first position so as to generate a first portion of a locus of curvature as said bar is traversed; and



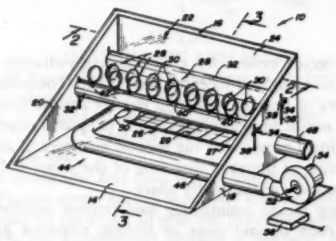
g. means to move one of said supports at one end of said first portion so as to generate a second portion of said locus of curvature as said bar continues traversal comprising:
a. a pivotal link, carrying said one of said supports pivotally on said base; and
b. a dog plate, carried by said cam bar, wherein as said cam bar is traversed relative to said base, said dog plate contacts said one of said supports, driving said support arcuately away from said first position and causing generation of said second locus portion as said cam bar continues traversal.

4,071,016

SOLAR ENERGY COLLECTING APPARATUS

Thomas D. Henderson, Elyria, Ohio, assignor to Solar Energy For The Family Inc., Elyria, Ohio

Filed Aug. 23, 1976, Ser. No. 716,522
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—270 5 Claims



1. A solar energy collecting apparatus comprising:
a housing including a bottom wall, an end wall, and a pair of side walls of generally triangular configuration formed from heat insulating material to define an upwardly open chamber of generally triangular cross-section;
a solar energy transmissive member carried by said walls over said chamber;

a heat-absorbing and collecting mass in said chamber generally between said side walls and adjacent the juncture of said bottom wall and said end wall;

a plurality of lens means mounted in said chamber intermediate said transmission member and said mass for focusing solar energy passing through said transmissive member against said mass;

adjustable support means for said lens means carried by at least one of said side walls and extending generally between said side walls, said support means permitting selective adjustment of the angle of inclination of said lens means;

conduit means for directing a fluid to be heated through said chamber in an impinging heat exchange relationship with said mass, said conduit means including an inlet duct extending into chamber to a discharge opening positioned adjacent one end of said mass and an outlet duct extending outwardly of said chamber from an inlet opening positioned adjacent the opposite end of said mass, whereby the fluid to be heated passes from said inlet duct discharge opening across said mass so that heat is transferred from said mass thereto with said fluid then passing into said outlet duct inlet opening for conveyance from said chamber; and,

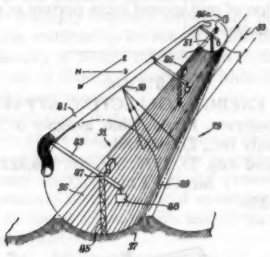
means for causing said fluid to flow through said conduit means.

4,071,017

TENSIONED REFLECTOR SUPPORT SYSTEM

John L. Russell, Jr., and Robert Edward Potthoff, both of La Jolla, Calif., assignors to General Atomic Company, San Diego, Calif.

Filed July 1, 1976, Ser. No. 701,647
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—271 **24 Claims**



1. A reflector system for concentrating radiation from a source on an elongated receptor, said system comprising:

a plurality of pairs of long, thin flexible tension members;

support means supporting said pairs in spaced relation in a cylindrical array, with the tension members of each pair extending in the axial direction of the array and spaced substantially equidistantly apart;

tensioning means maintaining said tension members taut, with each of said pairs of tension members generally defining a respective plane; and

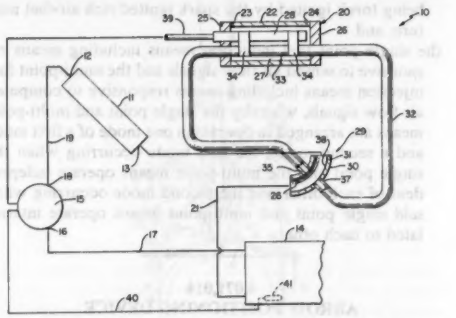
a plurality of thin reflecting elements each having a substantially planar surface reflective of radiation from the source, said reflecting elements being mounted on respective pairs of tension members with said planar surfaces substantially parallel to respective ones of said planes, the tension members of each respective pair being relatively disposed to reflect the radiation from substantially all of said planar surfaces to the receptor.

4,071,018

SOLAR HEAT COLLECTOR SYSTEM, PARTS THEREFOR AND METHODS

Charles H. Perkins, Newtown Square, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Aug. 30, 1976, Ser. No. 718,758
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—271 **40 Claims**



1. In a solar heat collector system having a solar heat collector provided with an inlet and an outlet, a pump means, a return means, and a fluid storage means that is interconnected to said inlet of said solar heat collector by said pump means and is also interconnected to said outlet of said collector by said return means, the improvement comprising the combination of a temperature sensor operatively interconnected to said pump means to turn on said pump means when said sensor senses a temperature above a first certain magnitude above the temperature of the fluid in said storage means and to turn off said pump means when said sensor senses a temperature below a second certain magnitude above the temperature of said fluid in said storage means, and means for directing fluid from said return means to adjacent said sensor to change the temperature thereof.

4,071,019

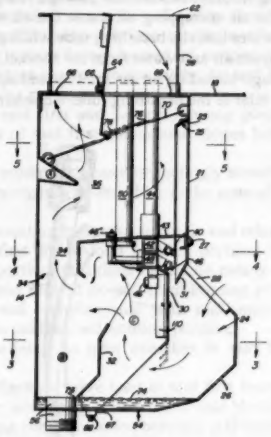
GREASE EXTRACTOR

Roy R. King, Houston, Tex., assignor to Industrial Industries, Inc., Houston, Tex.

Filed Apr. 8, 1976, Ser. No. 675,203
Int. Cl.[2] F24C *15/20*
U.S. Cl. 126—299 E **13 Claims**

1. A ventilating system for drawing air from above cooking ranges and the like, comprising; a vertically oriented, upstanding housing adapted for mounting above a cooking range, a hood member secured to the housing for collecting contaminated air for passage through the housing, an entry chamber having an opening at an angle to the vertical arranged on the housing and adjacent the hood member, a plurality of baffle plates within the housing and arranged transversely of the air flowing through said housing, nozzle means within the chamber for imparting a spray of cold water across substantially the width of the chamber to extract contaminant materials entrained in the air, additional nozzle means disposed within the entry chamber for imparting a spray of hot wash liquid to said chamber and the baffle plates arranged therein, sump means at the bottom of said chamber for collecting and removing excess liquid and contaminant materials collected at the bottom of the chamber, an expansion chamber within the housing arranged above the forementioned structure to receive the flow of air and to permit an expansion and slowing of movement thereof, an exhaust duct communicating with the expansion chamber for exhausting the air after cleaning thereof, an easily remov-

able central manifold structure, and said nozzle means and additional means are provided upon said central manifold



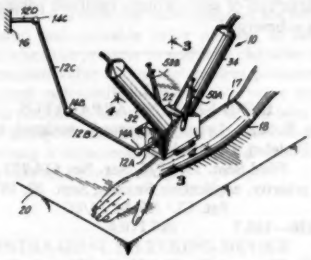
structure for complete assembly and removal of the entire arrangement as an integral unit.

4,071,020

APPARATUS AND METHODS FOR PERFORMING IN-VIVO MEASUREMENTS OF ENZYME ACTIVITY

Peter Pugliese, Bernville, Pa., assignor to Xienta, Inc., Bernville, Pa.

Filed June 3, 1976, Ser. No. 692,511
Int. Cl.[2] A61B *5/00, 10/00;* **G01N** *33/16;* **G01T** *1/161*
U.S. Cl. 128—2 A **17 Claims**



7. A method for performing an in-vivo measurement of a substrate, enzyme, or other biochemical agent on the skin or mucous membranes of an accessible body surface of a patient comprising the steps of reacting at least one chemical with said substrate, enzyme or other biochemical agent on a predetermined area of the skin or mucous membranes of the patient to produce at least one reaction product, and measuring a physical characteristic of said at least one reaction product.

4,071,021

MECHANICAL BACK SCRATCHER

Joe Gallacci, Ukiah, Calif., assignor to The Raymond Lee Organization, Inc., a part interest

Filed July 12, 1976, Ser. No. 704,441
Int. Cl.[2] A61H *7/00*
U.S. Cl. 128—52 **1 Claim**

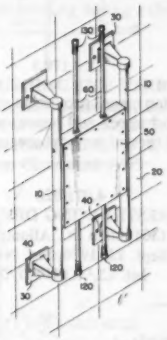
1. A back scratcher for use with a vertical wall and comprising:

first and second vertical spaced parallel bars disposed in front of the wall and secured thereto in fixed position;

a vertical hollow housing disposed between the bars and secured thereto;

first and second vertical spaced parallel shafts disposed between the bars extending slidably through the housing, the top ends of the shafts being disposed above the housing, the bottom ends of the shafts being disposed below the housing, said shafts being movable vertically in their axial direction between a raised position and a lowered position at which the top ends of the shaft approach the housing;

four coil springs, each spring being disposed concentrically about a corresponding shaft adjacent a corresponding end thereof, said springs being disposed outside of the housing;



a horizontal track secured to both shafts and disposed inside the housing at the rear of the shafts, said track having a rear disposed horizontal groove;

a rotatable vertical disc in the housing at the rear of the track;

a horizontal stud secured at one end to the disc in an off center position, the other end of the stud engaging said groove;

an electric motor disposed at the rear of the housing and having a horizontal drive shaft extending into said housing and secured to the center of the disc whereby rotation of the drive shaft imparts vertical reciprocating motion to said vertical shafts; and

scratching means secured between the ends of the vertical shafts.

4,071,022

ORTHOPEDIC ARM SLING

Marion H. Ewers, Payson, Ariz., assignor to Air Rotor Development Company, Inc., Payson, Ariz.

Filed Oct. 26, 1976, Ser. No. 735,306
Int. Cl.[2] A61F *5/40*
U.S. Cl. 128—94 **10 Claims**

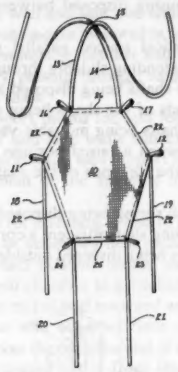
1. An orthopedic arm sling which comprises:

a. A flexible apron having upper and lower edges forming a cradle for receiving an arm and providing support therefor along a substantial portion of the arm, said cradle maintaining the arm against the body of the wearer;

b. First support means comprising straps connected to the upper edge of said apron at spaced locations proximate to the body of the wearer, said straps adapted to extend over the shoulders of the wearer;

c. First fastening means connected to said apron at spaced locations proximate to the arm to be supported for engaging and securing said straps;

d. Second support means attached to the lower edge of said apron;



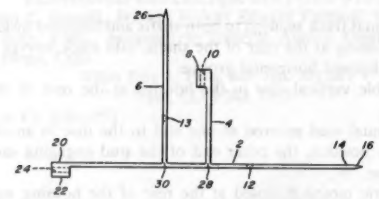
e. Second fastening means proximate said first support means connecting said upper and lower edges of said apron by engaging said second support means to form a cradle.

4,071,023

RESTRAINING DEVICE

Peter J. Gregory, 1301 Allen St., Aliquippa, Pa. 15001

Filed Sept. 13, 1976, Ser. No. 722,367
Int. Cl.[2] A61F *13/00*
U.S. Cl. 128—133 **12 Claims**



1. A restraining device comprising,
an elongated unitary body portion,
a pair of arms extending outwardly from said body portion, each said arm being of such length and position on said body portion as to cooperate with one end of said body portion in establishing a closed loop,
locking means for resisting opening of said closed loop, and
said locking means having means for permanently resisting loop enlargement so as to preclude substantial loop enlargement without permanent destruction of said loop, and
said locking means having adjustable means providing a number of different locking positions corresponding to different loop sizes, whereby
each of said loops will be partially defined by said body portion, partially defined by one said arm and will be permanently secured by said locking means.

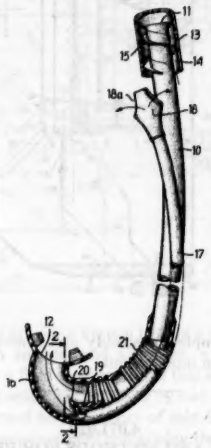
4,071,024

SNORKEL

Max A. Blanc, Bayonne, France, assignor to Max A. Blanc, Bayonne, France and William B. Anderson, West Palm Beach, Fla.

Filed July 30, 1976, Ser. No. 710,189
Int. Cl.[2] A62B *7/00*
U.S. Cl. 128—145 A **10 Claims**

1. A snorkel comprising a breathing tube having an air inlet at one end for admitting air to a diver beneath the surface of the water, inhalation means at the opposite end of the breathing tube to enable the diver to inhale air, air entrapping means at the air inlet to entrap air when the air inlet is submerged, and means defining a tortuous enclosed passage from the ambient air through the air entrapping means to the air inlet to retard the intake of water into the breathing tube while permitting the purging of impure air and water from the snorkel, said tortuous enclosed passage including an air inlet spaced apart from and below the air inlet to the breathing tube, a discharge communicating with the air inlet to the breathing tube and an intermediate enclosed passage forming part of said air entrapping means and winding around the axis of the breathing tube so that air can be freely taken in when the air inlet to the tortuous enclosed passage communicates with air and water can be purged from the tube by exhaled air forced into and entrapped within the discharge end of said tortuous enclosed passage when the air inlet is submerged.

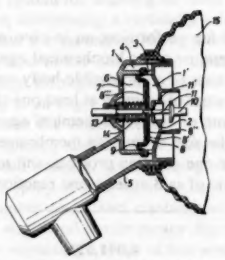


4,071,025

LUNG-VENTING APPARATUS

Ole Bjorn Kohnke, Lyngby, Denmark, assignor to Ruth Lee Hesse, Piniehoj, Denmark

Filed Sept. 19, 1975, Ser. No. 614,953
Claims priority, application Sweden, Sept. 20, 1974, 7411883
Int. Cl.[2] A61M *16/00*
U.S. Cl. 128—145.7 **3 Claims**



1. In a manually operated lung-venting apparatus including a self-expanding bladder having a bladder inlet through which treating gas is drawn into the bladder during expansion thereof; a bladder outlet through which treating gas is driven out of the bladder during compression thereof and a three-way breathing valve having an inlet in communication with the bladder outlet and an outlet to be connected to the respiratory

system of a patient; the improvement comprising, in combination, a valve device having

a. a housing having first, second and third housing portions;

b. a first mounting means for releasably securing said first and second housing portions to one another; said first mounting means being formed of cooperating first and second ridges carried, respectively, by said first and second housing portions for providing a snap-in engagement between said first and second housing portions, by engagement of said first and second ridges behind one another;

c. a second mounting means for sealingly securing said third housing portion to said bladder in the zone of said bladder outlet;

d. a third mounting means for sealingly and releasably securing said first and second housing portions to said third housing portion; said third mounting means including an inner thread formed on said third housing portion and an outer thread complemental with said inner thread and formed on said second housing portion;

e. means defining an inlet chamber in said first housing portion;

f. means defining a valve inlet in said first housing portion; said valve inlet being connected to said bladder outlet for establishing communication between said bladder and said inlet chamber;

g. means defining a valve outlet in said first housing portion; and means defining an outlet chamber in said second housing portion; said valve outlet being in continuous communication with said outlet chamber; said outlet chamber being connected to the inlet of said three-way breathing valve;

h. a movable valve member supported in said first housing portion adjacent said valve inlet for opening and closing said valve inlet; said movable valve member having an open position in which communication is maintained between said bladder and said inlet chamber and a closed position in which gas flow is blocked from said bladder to said inlet chamber; and

i. control means arranged in said first housing portion and connected to said movable valve member for moving and maintaining said movable valve member in said closed position when the pressure in said inlet chamber exceeds a predetermined value above the ambient pressure and for moving and maintaining said movable valve member in said open position when the pressure in said inlet chamber is below said predetermined value; said first housing portion forming a structural unit with said movable valve member and said control means.

4,071,026

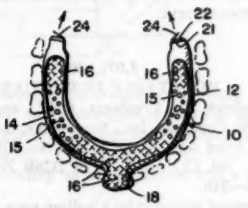
INTRA-ORAL FILTERING DEVICE

Jesse Althen Bevins, 1532 E. 59th St., Chicago, Ill. 60637

Filed Feb. 5, 1976, Ser. No. 655,418

Int. Cl.[2] A62B *23/02*

U.S. Cl. 128—147 **4 Claims**



1. An intra-oral device for filtering and removing noxious materials from the air during the breathing process, including in combination:

a U-shaped housing defining at least one cavity portion therein and having a mouth-piece portion located intermediate the ends of said housing, said mouth-piece portion having an opening therein for receiving unpurified air into said housing, said mouth-piece opening communicating with at least one of said cavity portions, said U-shaped housing having exit openings therein at each of the ends thereof, each of said openings further communicating with at least one of said cavity portions,

filter means mounted in at least one of said cavity portions of said housing for filtering and removing noxious materials from the air passing through said filter means, and

valve means mounted to said ends of said U-shaped housing and selectively engageable with each of the exit openings, said valve means being operable between an open position away from the opening to permit the exit of filtered air from said housing during inhalation and a closed position engaging the opening to prevent the entrance of spent air and saliva into said housing during exhalation.

4,071,027

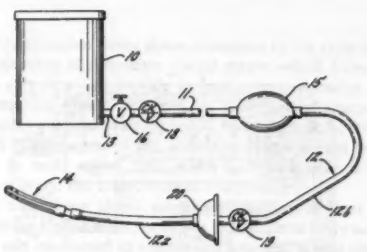
METHOD FOR FLUSHING THE UTERUS OF A SOW

Lawrence Dean Meador, R.R. 2, Lanark, Ill. 61046

Continuation-in-part of Ser. No. 599,877, Aug. 27, 1975, abandoned. This application Oct. 18, 1976, Ser. No. 733,159

Int. Cl.[2] A61M *1/00*

U.S. Cl. 128—231 **2 Claims**



1. The method of flushing the uterine horns of a sow after farrowing with a reservoir containing flushing fluid, flexible tubing communicating with said reservoir, a squeeze bulb interposed in said tubing intermediate the ends thereof and a soft but relatively rigid hollow tip connected to the free end of said tubing at an angle thereto and having holes through which the liquid may flow, said method comprising the steps of, inserting the tip into the uterine canal of a sow with the tip pointed down toward the sow's underline, such insertion continuing until the tip enters through the hip bones of the sow, turning said tip 90° in one direction, thereafter continuing the insertion until the tip enters ones uterine horn of the sow, squeezing said bulb to inject said liquid into said horn, thereafter retracting said tip to a point adjacent said hip bones and turning the tip 180° in the opposite direction, inserting said tip into the other uterine horn of the sow, squeezing said bulb to inject said liquid into said other horn, and retracting the tip and the tubing from the uterus of the sow.

4,071,028

RADIO FREQUENCY CAUTERY INSTRUMENT AND CONTROL UNIT THEREFOR

George C. Perkins, 5809 Braniff Drive, Oklahoma City, Okla. 73105

Filed Feb. 17, 1976, Ser. No. 658,598

Int. Cl.[2] A61B *17/36*; A61N *3/02*

U.S. Cl. 128—303.14 **13 Claims**

1. An improved radio frequency cautery instrument, comprising in combination:

radio frequency signal generation means having at least one

radio frequency signal output terminal and first and second electrical power input terminals;

first power conductor means for electrically connecting the first electrical power input terminal to one side of an alternating current electrical power source;

voltage controlled switch means having first and second main terminals and a control gate terminal;

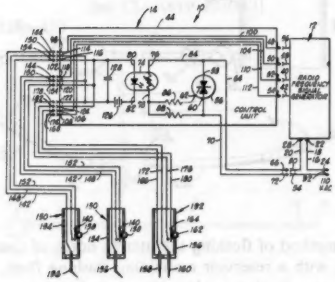
second power conductor means for electrically connecting the second electrical power input terminal to the first main terminal of said voltage controlled switch means;

third power conductor means for electrically connecting the second main terminal of said voltage controlled switch means to the opposite side of the alternating current electrical power source;

photon coupled isolator means having first and second control terminals and first and second main terminals;

electrical conductor means for electrically connecting the first main terminal of said voltage controlled switch means and the first main terminal of said photon coupled isolator means;

first electrical resistance means for interconnecting the second main terminal of said photon coupled isolator means



and the control gate terminal of said voltage controlled switch means;

second electrical resistance means for interconnecting the second main terminal of said photon coupled isolator means and the second main terminal of said voltage controlled switch means;

radio frequency conductor means having first and second ends for electrical connection at the first end thereof to the radio frequency signal output terminal of said radio frequency signal generation means;

cautery electrode means electrically connected to the second end of said radio frequency conductor means;

manually actuated switch means carried adjacent said cautery electrode means and having opposite poles;

first control conductor means for interconnecting one pole of said manually actuated switch means and the first control terminal of said photon coupled isolator means;

a voltage source having opposite terminals with one terminal thereof electrically connected to the second control terminal of said photon coupled isolator means; and

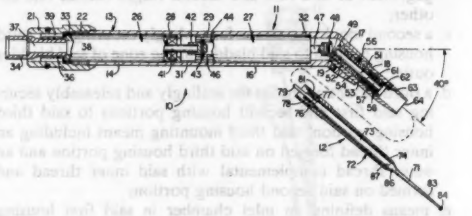
second control conductor means for interconnecting the opposite pole of said manually actuated switch means and the opposite terminal of said voltage source.

4,071,029

ANGLE HANDPIECE

James W. Richmond, Comstock Township, Kalamazoo County, and Earl H. Rhodes, Jr., Oshtemo Township, Kalamazoo County, both of Mich., assignors to Stryker Corporation, Kalamazoo, Mich.

Filed May 21, 1976, Ser. No. 688,567
Int. Cl.[2] A61B *17/16, 17/32*
U.S. Cl. 128—305 **6 Claims**



1. In a surgical instrument, particularly for ear surgery, having a handpiece assembly formed by an angled housing having a motor mounted therein, rotatable connecting means disposed within said housing for driving connection with a tool assembly, and drive transmitting means interconnected between said motor and said connecting means, comprising the improvement wherein:

said angled housing includes an elongated tubular grip portion having said motor positioned therein and an elongated tubular nose portion fixedly connected to one end of said grip portion, said grip portion having a length which is several times longer than the length of said nose portion;

said nose portion having said connecting means positioned therein, and said nose portion extending in a direction which is inclined at an angle of **40°** relative to the longitudinal direction of said grip portion; and

said tool assembly comprising a tool unit removably attached to said nose portion and drivably connected to said connecting means;

said tool unit including an elongated support sleeve removably inserted into the open free end of said nose portion, said nose portion and the rear end of said support sleeve having cooperating means forming a disconnectible connection for fixedly but releasably connecting said support sleeve to said nose portion so that said support sleeve is coaxilally aligned with and forms an outwardly projecting extension from said nose portion;

said tool unit further including an elongated tool axially fixedly connected to said support sleeve, said tool having an elongated cylindrical shank disposed within and coaxially rotatably supported by said support sleeve, said shank having a driving portion on the rearward end thereof adapted for driving connection with said rotatable connecting means, and said tool including a part thereof projecting coaxially outwardly beyond the front end of said support sleeve.

4,071,030

ROTATABLE DURAGUARD

John R. Hedrick, La Crescenta, Calif., assignor to Pevrick Engineering Company, Inc., Sun Valley, Calif.

Filed Apr. 12, 1976, Ser. No. 675,709
Int. Cl.[2] A61B *17/16;* **B26B** *29/00*
U.S. Cl. 128—310 **5 Claims**

1. A duraguard mounted by a hollow nose section secured to the housing of a cutting tool, the duraguard having an arm extending along the cutting tool and terminating in a foot projecting over the end of the cutting tool, the improvement comprising:

means for securing said nose section to one end of said housing from which said cutting tool extends, said nose

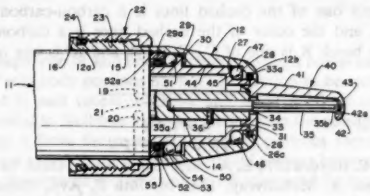
section having an interior surface defining a hollow interior space;

a guard mounting member located in said nose section;

means for rotatably mounting said guard mounting member on said nose section for free rotation about the axis of said tool;

one end of said arm being secured to said guard mounting member;

said foot being secured to the other end of said arm and projecting over the end of said cutting tool, and said arm being free to rotate and follow the cut produced by said cutting tool;



said mounting means comprising two separate sets of ball bearings located between said guard mounting member and said nose section and positioned adjacent opposite ends of said guard mounting member; and

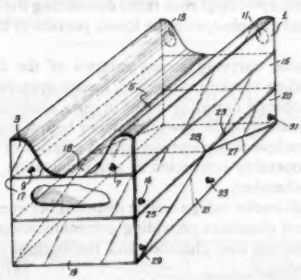
each set of ball bearings consisting of a circular row of ball bearings around said guard mounting member, each row of ball bearings being located in a space between a radially projecting planar flange surface and a radially projecting contoured surface, one of said surfaces for locating each of said rows being located on said interior surface of said nose section and the other of said surfaces being located on the exterior of said guard mounting member.

4,071,031

INFLATABLE LEG ELEVATOR WITH MEANS FOR APPLYING THERMAL TREATMENT

Thomas Lowman, 455 Shore Acres Road, Arnold, Md. 21012

Filed Aug. 30, 1976, Ser. No. 718,480
Int. Cl.[2] A61F *7/00*
U.S. Cl. 128—402 **6 Claims**



1. A body limb elevator and support comprising:

a. a plurality of air and water-tight sections in the form of compartments made of flexible material and being sealed from each other;

b. the support including an upper section and a lower section;

c. said upper section having a trough formed therein;

d. said lower section having upper and lower substantially parallel walls and being divided into at least two separate compartments;

e. means for inserting fluid into said at least two separate compartments;

f. said at least two separate compartments being formed substantially triangular in cross-section, a wall between two of said at least two separate compartments being inclined upwardly from said lower wall of the support and contacting a compartment thereabove;

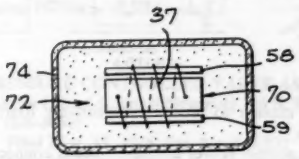
whereby when one of said separate compartments has fluid therein and another of said separate compartments is substantially free of fluid, the support and trough will tilt; and when all of said separate compartments are substantially full of fluid the support will be substantially horizontal.

4,071,032

IMPLANTABLE LIVING TISSUE STIMULATORS

Joseph H. Schulman, Los Angeles, Calif., assignor to Pacesetter Systems Inc., Sylmar, Calif.

Filed Jan. 29, 1976, Ser. No. 653,462
Int. Cl.[2] A61N *1/36*
U.S. Cl. 128—419 P **25 Claims**



1. In an implantable living tissue stimulator of the type comprising a plurality of stimulator circuit means which form the stimulator circuitry and include at least a power source and pulse generating means powered by said power source to provide pulses adapted to be applied to body tissue to be stimulated, with at least some of the stimulator circuit means being exposable to body saline fluid when said stimulator is implanted in a body, the improvement comprising:

current conductive shield means surrounding at least the stimulator circuit means which is exposable to body saline fluid, and connected to a reference potential in said stimulator circuitry for substantially inhibiting the flow of current via body saline fluid to or from said circuit means which are exposable to the body saline fluid, by conducting said current to said reference potential.

14. In an implantable living tissue stimulator of the type comprising a plurality of stimulator circuit means which form the stimulator circuitry and include at least a power source, pulse generating means powered by said power source to provide pulses adapted to be applied to tissue to be stimulated, a coil and a circuit connected to said coil and responsive to a current induced in said coil by an alternating magnetic field external to said body, the improvement comprising:

said coil being wound about at least some of said stimulator circuit means; and

matter means of high magnetic permeability extending through the coil for at least diverting a substantial portion of the magnetic field which passes through said coil from the stimulator circuit means about which the coil is wound, the dimension of said matter means along the longitudinal axis of said coil, being not less than the extent of the stimulator circuit means about which said coil is wound, along said longitudinal axis.

4,071,033

ELECTROTHERAPEUTIC DEVICE WITH MODULATED DUAL SIGNALS

Edward P. Nawracaj, 8349 Walredon Ave., Burr Ridge, Ill. 60521, and Henry A. Greit, 3527 W. 80th St., Chicago, Ill. 60652

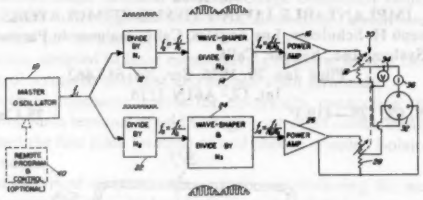
Filed Dec. 20, 1976, Ser. No. 752,597
Int. Cl.[2] A61N *1/36*
U.S. Cl. 128—420 A **6 Claims**

1. An electrotherapeutic device for applying thereapeutic

electrical currents to the body of a patient comprising: oscillator means for producing first electric signals of a predetermined first frequency;

first and second divider means connected to receive said first electrical signals and to divide the frequency thereof by first and second numbers respectively to produce second and third signals respectively;

first and second waveshaping means connected respectively to receive said second and third signals and to shape the envelopes for these signals in a corresponding predetermined manner to produce respectively fourth and fifth signals;



first and second power amplifier means connected respectively to amplify said fourth and fifth signals; amplitude control means associated with said first and second power amplifier means to control the output voltage level of the outputs of said first and second power amplifier means;

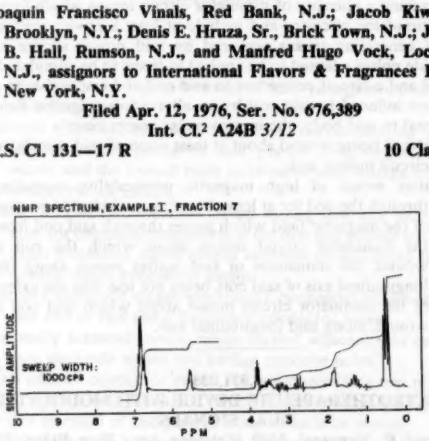
applicator means for receiving said amplified fourth and fifth signals from the first and second power amplifier means respectively and applying these signals to the body of the patient.

4,071,034

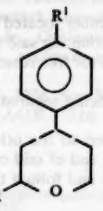
2-ALKYL-4-PHENYL-DIHYDROPYRANS AND PROCESSES FOR AUGMENTING THE ORGANOLEPTIC PROPERTIES OF TOBACCO USING ONE OR MORE OF SAID PYRANS

Joaquin Francisco Vinals, Red Bank, N.J.; Jacob Kiwala, Brooklyn, N.Y.; Denis E. Hruza, Sr., Brick Town, N.J.; John B. Hall, Rumson, N.J., and Manfred Hugo Vock, Locust, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Apr. 12, 1976, Ser. No. 676,389
Int. Cl.² A24B *3/12*
U.S. Cl. 131—17 R **10 Claims**



1. A smoking tobacco product comprising smoking tobacco, said product having added thereto a small amount sufficient to augment or enhance the flavor or aroma of the smoking tobacco product of one or more pyran derivatives having the generic structure:



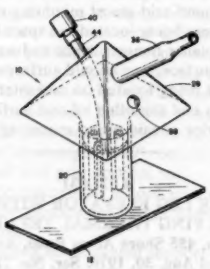
wherein one of the dashed lines is a carbon-carbon double bond, and the other of the dashed lines is a carbon-carbon single bond; R is one of C_2–C_4 alkyl, and R^1 is one of C_1–C_3 alkyl.

4,071,035

PYRAMID PIPE

Cecil E. Boyd, 2857½ E. Admiral Court, Tulsa, Okla. 74110, and Bruce K. McGillvray, 1346 N. 74th E. Ave., Tulsa, Okla. 74115

Filed Oct. 1, 1976, Ser. No. 728,597
Int. Cl.² A24F *1/14, 1/30*
U.S. Cl. 131—173 **10 Claims**



1. A double chamber smoke filtering apparatus comprising:

a. a first chamber for receiving a filtering liquid therein;

b. a second chamber disposed above the first chamber;

c. a plurality of fluid riser tubes connecting the bottom of the second chamber with the lower portion of the first chamber;

d. tobacco carrying means exterior of the chambers and including smoke passageway means operably connecting the tobacco carrying means in open communication with the bottom of the lower chamber below the riser tubes;

e. a mouthpiece passageway means exterior of the chambers and operably connected in communication with the second chamber;

f. a small smoke escape orifice disposed between the first and second chambers providing communication between the top of the first chamber and the bottom of the second chamber.

4,071,036

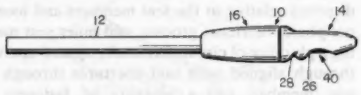
HOLDER FOR ELONGATE TOBACCO PRODUCT

James D. Jacobs, 1030 Old Orchard Drive, Wauseon, Ohio 43567

Filed Dec. 6, 1976, Ser. No. 747,886
Int. Cl.² A24F *13/02*
U.S. Cl. 131—187 **8 Claims**

1. A holder for an elongate tobacco product comprising a body having an outer end and an inner end, said body forming a passage extending from the outer end toward but stopping short of the inner end, said body having an opening communicating between an inner end portion of said passage and a side

portion of said body, said passage being of sufficient size substantially throughout its length at least to the inner end portion thereof to receive an insert, whereby the tongue of a smoker can contact the insert in said passage through said opening when the inner end of said body is in the smoker's mouth, said body comprising two body portions, an inner body portion having the inner end and the inner end of said passage and an outer body portion having the outer end and the outer end of



said passage, one of said body portions having a recess and the other of said body portions having a projection to be received and held in said recess whereby said body portions can be disassembled to facilitate inserting the insert in the passage and removing it from the passage, said body portions forming a chamber at an intermediate portion of said passage between the insert in the passage and an elongate tobacco product received in the outer end of the passage.

4,071,037

PREPARATION AND METHOD OF USE OF ENZYME EFFECTIVE FOR CONVERSION AND DETECTION OF CARBON MONOXIDE

Israel Herbert Scheinberg, 5447 Palisade Ave., Bronx, N.Y. 10471

Continuation-in-part of Ser. No. 659,199, Feb. 19, 1976, Pat. No. 3,982,897, which is a continuation-in-part of Ser. No. 292,011, Sept. 25, 1972, which is a continuation-in-part of Ser. No. 151,153, June 8, 1971, abandoned, and Ser. No. 102,869, June 8, 1971, Pat. No. 3,693,327, which is a continuation-in-part of Ser. No. 85,087, Oct. 29, 1970, abandoned. This application Aug. 18, 1976, Ser. No. 715,479

The portion of the term of this patent subsequent to Sept. 28, 1993, has been disclaimed.

Int. Cl.[2] A24B *15/027*; G01N *31/14*; C07G *7/02*

U.S. Cl. 131—266 **47 Claims**

1. A filter for the conversion and detection of CO in a gas stream, comprising a container suitable for transit of a gas stream therethrough and a composition including enzyme carbon monoxidase, hereinafter referred to as CMase.

14. The filter as claimed in claim 1, wherein said filter is part of a smoking device.

4,071,038

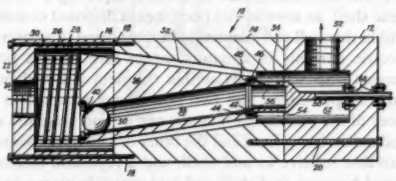
FAILSAFE FLUID CONTROL VALVE

Dale D. Robinson, 225 Smith Road, Spring Valley, N.Y. 10977

Filed Oct. 1, 1976, Ser. No. 728,507

Int. Cl.[2] F16K *17/28*

U.S. Cl. 137—59 **9 Claims**



1. A failsafe fluid control valve comprising a hollow housing, a fluid inlet port at one end of said housing, a fluid outlet port at the other end of said housing, means to pass a fluid into said hollow housing through said inlet port, said housing having a central inner fluid flow control section, the inner surface of said central section converging in a downstream direction of fluid flow, a hollow channel, said channel being displaceably suspended within the central section of said housing, the outer surface of said channel converging in a downstream direction of fluid flow so that when said channel is displaced downstream, the outer surface of said channel mates with the inner surface of said central section to stop fluid flow, said hollow channel having an inner passage, said passage being inclined upwardly in a downstream direction, a substantially spherical ball, said ball being disposed in said passage, stop means at each end of said passage to prevent said ball from passing out of said passage, ball receiving means at the downstream end of said passage so that when said ball reaches said ball receiving means, fluid flow through said passage is terminated, the diameter of said ball being less than the height of said passage so that said ball may move freely upwards or downwards through said passage depending on differential pressure of fluid flow, a spring, said spring extending between said channel and the fluid inlet end of said housing, and a rod, said rod extending into the fluid outlet end of said housing to the downstream end of said channel, so that displacement of said rod moves said channel against the force of said spring.

4,071,039

FLUID PRESSURE CONTROLLED VALVE ASSEMBLY

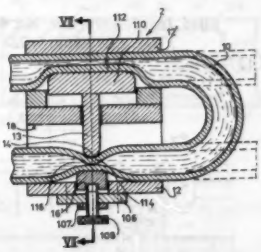
Sven Karl Lennart Goof, Gammel Strandvej 236 B, Humlebaek, Denmark (DK-3050)

Filed Mar. 17, 1976, Ser. No. 667,832

Claims priority, application Denmark, Mar. 20, 1975, 1186/75

Int. Cl.[2] G05D *16/06*

U.S. Cl. 137—87 **9 Claims**



9. A fluid pressure controlled valve assembly comprising: a body portion; a first bore extending through said body portion; a second bore spaced from said first bore, extending through said body portion; a third bore in said body portion, extending between and in communication with said first bore and said second bore; and plunger means mounted in said third bore, having a control end and a head end, said control end formed to continually contact a first tube length received in said first bore, said head end formed to continually contact a second tube length received in said second bore, and said plunger means being movable toward and away from said first tube length responsive to pressure forces exerted on said head end by said second tube length so as to transfer corresponding compressive forces to said first tube length through said control end.

4,071,040

WATER-PROOF AIR-PRESSURE EQUALIZING VALVE

Lawrence James Moriarty, Galion, Ohio, assignor to North Electric Company, Galion, Ohio

Filed Mar. 18, 1976, Ser. No. 667,895

Int. Cl.[2] H04M *1/03*

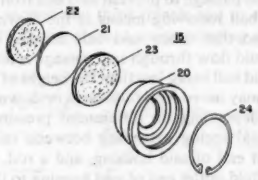
U.S. Cl. 137—199 **2 Claims**

1. A gaseous relief valve for an enclosure containing delicate electronic communication equipment which must be pressurized over a range of gas pressures and protected against immersion in a liquid comprising:

a. a housing for said equipment defining an aperture,

b. a first sheet of thin, gas-permeable, liquid-repellent material incapable of withstanding substantial liquid pressure without deformation or rupture;

c. second and third sheets of a mechanically-rigid gas-permeable material disposed on opposite sides of said first sheet, said second and third sheets each having one surface in physical contact with an adjoining surface of said first sheet over substantially the entire surface area thereof, thereby forming a mechanically-rigid sandwich without voids between adjoining surfaces of said sheets; and



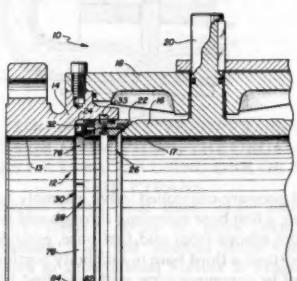
d. sealing means for retaining said three sheets in a fixed position across said aperture.

4,071,041

BALL VALVE SEAT RING CONSTRUCTION

George A. Moran, Jr., and Willard J. Sitton, both of Houston, Tex., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Jan. 7, 1976, Ser. No. 647,286
Int. Cl.[2] F16K 5/22
U.S. Cl. 137—246.22 6 Claims



1. A spherical plug valve, comprising:

a. a valve body having a valve chamber therein, flow passageways through said valve body in communication with said valve chamber, a spherical plug member positioned in said valve chamber movable between open and closed positions relative to said flow passageways and a lubricant passageway through said valve body for seat lubrication,

b. an annular seat pocket in said valve body around at least one of said flow passageways and having a seat supporting abutment,

c. a seat ring positioned in said seat pocket having inner and outer concentric seat members of generally cylindrical form arranged in juxtapositioned relation to each other, and a seal ring mounted between said seat members and having an end portion in contact with the exterior surface of said spherical plug member, said outer seat member having an inside peripheral surface facing said inner concentric seat member, a seal ring mounting groove around said inside peripheral surface at one end portion thereof to receive and mount said seal ring, and said outer seat member having a lubricant groove around a mid-portion of the outer peripheral surface thereof, said inner seat member having an outer peripheral surface adjacent said outer seat member inside surface with one end of said outer peripheral surface overlying a mid-portion of said seal ring such that said inner seat member retains said seal ring in said seal ring mounting groove,

d. said outer seat member having a plurality of circumferentially spaced apertures therearound which are radially disposed relative to the seat members and located in said peripheral lubricant groove, said inner seat member having a plurality of circumferentially spaced apertures therethrough aligned with said apertures through said outer seat member, and a plurality of fasteners extending through said apertures in said seat members to secure said seat members together;

e. cooperating means on said inner seat member and said outer seat member to longitudinally position said seat members such that said circumferentially spaced apertures of both said seat members are aligned to facilitate mounting said fasteners,

f. said seat members each having an outer end which is opposite to said seal ring and oriented generally transverse to the longitudinal axis of said flow passageways, and

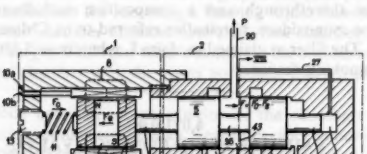
g. resilient means in said seat pocket contacting the outer ends of said seat members to urge said seat ring toward and into fluid-tight sealing contact with said spherical plug member.

4,071,042

ELECTROMAGNETIC ACTUATOR, NOTABLY FOR HYDRAULIC SERVO-CONTROL VALVE

Claude Edmond Lombard, and Jean-Marie Bouvet, both of Boulogne-Billancourt, France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed May 14, 1976, Ser. No. 686,505
Claims priority, application France, May 16, 1975, 75 15331; July 25, 1975, 75 23326
Int. Cl.[2] F16K 29/00, 31/08
U.S. Cl. 137—332 12 Claims

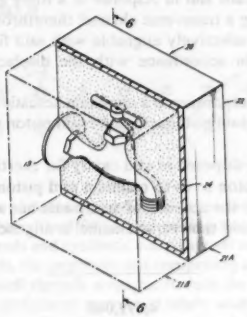


1. An electromagnetic actuator comprising a tubular magnetic shell, an annular field coil means disposed concentrically within the shell and adapted to be connected to a control direct electric current, an armature means formed of a permanent magnet disposed axially within the field coil and having an axial magnetization and two pole pieces attached to the side faces of the permanent magnet, one of said armature and field coil means being fixed and the other of said means being axially movable relative to said shell, and a repulsion member interposed between said shell and said movable means to exert on the latter a force opposed to the electromagnetic force exerted on said movable means by the control direct current supplied to said field coil means, said field coil means being axially longer than said armature means and pole pieces combined and including a pair of adjacent half-coils wound in opposite directions, each one of said half-coils overlapping respectively one of the two pole pieces.

4,071,043
APPARATUS FOR PROTECTING A WATER FAUCET OR THE LIKE FROM FREEZING TEMPERATURES

Cleo D. Carlson, P.O. Box 147, Lake Jackson, Tex. 77566

Filed June 4, 1976, Ser. No. 693,090
Int. Cl.[2] F16K *51/00*
U.S. Cl. 137—375 3 Claims

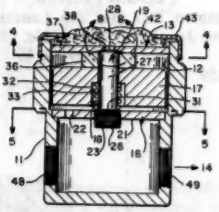


1. Apparatus for freeze protecting a water faucet which extends from a wall, comprising a pair of bodies of foamed plastic material having inner sides disposable on opposite sides of the faucet with their inner ends adjacent the wall and their outer ends beyond the outer end of the faucet, and a sleeve of relatively rigid, moisture impervious material having an open end for fitting over the bodies for forcing them toward one another, when so disposed, in order to cause their inner sides to be deformed into conformity with the faucet and tightly engaged with one another in surrounding relation to the faucet adjacent its extension from the wall and their inner ends to tightly engage with the wall from which the faucet extends, and an opposite closed end so as to enclose said bodies when said open end is moved against the wall, said sleeve holding said inner sides in such tight engagement so as to maintain a substantially air-tight enclosure about the top, bottom, sides and outer end of the faucet, but being releasable to permit removal of said bodies from said faucet.

4,071,044
AIR MONITORING VALVE FOR COMBUSTION ENGINES

Ralph E. Jones, 2634 Evelyn Court, Alameda, Calif. 94501

Continuation-in-part of Ser. No. 711,553, Aug. 4, 1976, abandoned. This application Sept. 15, 1976, Ser. No. 723,520
Int. Cl.[2] F02M *23/00*; F16K *17/24*
U.S. Cl. 137—479 4 Claims



1. An air monitoring valve for combustion engines comprising:

a housing providing an air cylinder having an air inlet opening and an air discharge passage, the latter being adapted for connection to an engine intake manifold;

means providing a valve seat in said cylinder and a pressure-responsive valve mounted in said cylinder for movement to and from said seat to regulate airflow in said discharge passage as a function of intake manifold pressure, said piston being formed to simultaneously provide a predetermined airflow past said piston and said pressure-responsive movement of said piston;

a stem threadably mounted in said cylinder and extending therefrom longitudinally thereof in the direction of, and having an end accessible through, said air inlet opening, said valve being mounted on said stem for longitudinal reciprocation in said cylinder to and from said seat;

spring means mounted between said stem and valve for biasing said valve away from said seat; and

a resiliently deflectable plate supported by said housing adjacent said inlet opening and formed with an opening aligned with and providing an interference fit with said stem end and affording access to said stem end for turning, said plate resiliently deflecting with rotative adjustment of, and applying longitudinal pressure to, said stem.

4,071,045
CHECK VALVE CONSTRUCTION

Theodore C. Brandt, Tyler, Tex., assignor to General Electric Company, Louisville, Ky.

Filed Sept. 7, 1976, Ser. No. 720,580
Int. Cl.[2] F16K *15/04*
U.S. Cl. 137—528 5 Claims

1. A one-way ball check valve arranged in a refrigerant carrying tube member comprising:

a substantially cylindrical body member positioned in said tube member having an outer diameter less than the inner diameter of said tube member;

a centrally arranged passageway extending axially through said body member;

a valve seat arranged on one end of said axial passageway;

a first and second annular groove in said body member;

an annular sealing means arranged in said first groove engaging the inner wall of said tube to prevent refrigerant from leaking past said body member;

a valve cage in said tube member including circumferentially spaced axially extending guide members connected together at one end to form a cap portion;

a contact portion formed integral with said cap portion and projecting axially toward said valve seat;

tab portions extending radially inwardly from the other end of said guide members;

tab receiving means arranged in said body member for receiving said tab portions for holding said cage and said body member and for positioning said end cap portion relative to said valve seat;

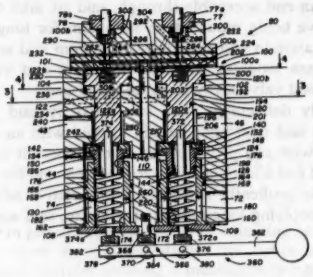
a plurality of circumferentially spaced holding means formed in said tube member projecting radially inwardly into engagement with said second groove in said body member for preventing movement of said body member relative to said tube member; and

a valve member arranged in said valve cage being operable under action of said refrigerant between a closed position on said valve seat and an open position in point contact against said contact portion.

4,071,046
DIRECTIONAL CONTROL POPPET VALVE

H. Alton Cates, 1119 Elmherst, Dallas, Tex. 75224

Filed Oct. 7, 1976, Ser. No. 730,651
Int. Cl.[2] F15B 13/04, 13/043
U.S. Cl. 137—596.15 22 Claims



17. A valve system for controlling the flow of pressurized fluid, comprising:

a valve housing;

an inlet port for receiving pressurized fluid;

a cylinder port in the housing;

an exhaust port in the housing;

a first passageway extending from the inlet port to the cylinder port;

a second passageway extending from the cylinder port to the exhaust port;

a poppet valve slidably positioned within the housing and normally seated against a valve seat within the housing to close the first passageway;

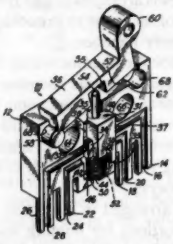
a piston slidable within the housing and normally seated against the poppet valve to close the second passageway; and

means for selectively moving the piston to open and close the first and second passageways to control the flow therethrough.

4,071,047
FLUID SWITCH

Sanford I. Greene, Hollywood, Fla., assignor to Micro Pneumatic Logic Inc., North Miami Beach, Fla.

Filed Sept. 30, 1975, Ser. No. 618,015
Int. Cl.[2] F16K 3/36, 11/06
U.S. Cl. 137—625.18 9 Claims



1. A fluid switch comprising:

a housing having first and second pairs of ports, a predetermined one of each of said pairs of ports having a fluid applied thereto under pressure;

a cavity in said housing, and a venting port in communication with said cavity;

first and second conduits extending between said first and second pairs of ports, respectively, the diameters of said conduits, and the pressure and viscosity of said fluid being such that the Reynolds number is approximately 2000, whereby fluid flows through said conduits in laminar flow, each of said conduits having a gap therein determined by said cavity intermediate said respective pairs of ports, the length of each gap being less than that wherein said laminar flow becomes turbulent;

a piston movable in said cavity in the absence of separate sealing means and in response to a force exerted thereon and having a transverse channel therethrough, said channel being selectively alignable with said first and second conduits in accordance with the displacement of said piston;

an actuator responsive to a minimum actuation force to exert a force on said piston and cause said piston to be displaced; and

a bias spring disposed in said cavity for exerting a bias force on said piston so as to maintain said piston in a quiescent position in the absence of said minimum actuation force, whereby said transverse channel is aligned with said first conduit.

4,071,048
COATED HOLLOW METAL TUBES AND PROCESS FOR PRODUCING COATED HOLLOW METAL TUBES PROCESSED BY BENDING, PRESSING OR PUNCHING

Hideo Watase, Hino, Japan, assignor to Teijin Chemicals, Ltd., Tokyo, Japan

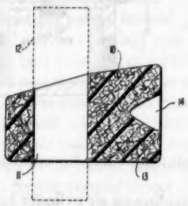
Filed May 18, 1976, Ser. No. 687,449
Claims priority, application Japan, Aug. 18, 1975, 50-99516
Int. Cl.[2] F16L 9/14
U.S. Cl. 138—145 17 Claims

1. A hollow metal tube coated with a thin film of a thermoplastic crystalline copolyester and being processable by bending, pressing or punching without the cracking or peeling of the coating; said hollow metal tube having a thin coating adhered tightly to the outer surface thereof of a thermoplastic crystalline copolyester composed of 95 to 70 mole%, based on its entire recurring units, of ethylene terephthalate units and 5 to 30 mole%, based on its entire recurring units, of a copolymerizable ester-forming unit other than the ethylene terephthalate unit and having a second order transition point of at least 50° C., said coating having a degree of crystallization of more than 1% and not more than 15%, and not more than 1/2.5 of its crystallizing ability, said crystallizing ability being the degree of crystallization attained when the copolyester in a substantially amorphous state is maintained at 150° C. for 3 hours.

4,071,049
LOOM PICKER

Charles H. Crumpton, P.O. Box 386, Lancaster, S.C. 29720

Filed Jan. 12, 1977, Ser. No. 758,672
Int. Cl.[2] D03D 49/36
U.S. Cl. 139—159 5 Claims

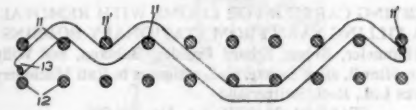


1. A loom picker comprising a substantially homogeneous molded body consisting of at least 90% asbestos, substantially 5% elastomer, and the balance by weight being a resin and a solid lubricant.

4,071,050
DOUBLE-LAYER FORMING FABRIC

Francisco Lorente Codorniu, Halmstad, Sweden, assignor to Nordiska Maskinfilt Aktiebolaget, Halmstad, Sweden

Continuation of Ser. No. 379,322, July 16, 1973, abandoned.
This application June 9, 1977, Ser. No. 804,950
Claims priority, application Sweden, Sept. 1, 1972, 11347/72
Int. Cl.² D03D *15/00*
U.S. Cl. 139—383 R 15 Claims

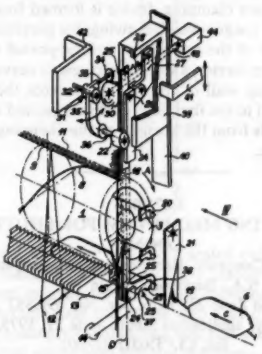


1. An improved forming fabric for paper-making, cellulose or similar machines, said fabric comprising two layers of synthetic weft threads and synthetic warp threads interconnecting said weft threads, the improvement comprising an upper one of said layers of weft threads arranged to face the material to be formed during position of use of said fabric, said upper layer as well as said warp threads interconnecting said weft layers being essentially tangents to the fabric plane intended to face said material, and each of said warp threads passing over at least one weft thread, under at least one following weft thread and over at least one thereon following weft thread of said upper weft layer before running down to interconnect the lower weft layer with the upper weft layer.

4,071,051
UNDULATED SHED LOOM WITH FILLING-THREAD CLAMPING DEVICE

Edgar Strauss, Agincourt, Canada, assignor to Ruti Machinery Works Ltd., Ruti, Switzerland

Filed June 7, 1976, Ser. No. 693,511
Claims priority, application Switzerland, June 17, 1975, 7823/75
Int. Cl.² D03D *45/50*
U.S. Cl. 139—436 5 Claims

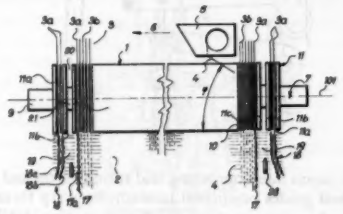


1. An undulated shed loom having an end of the shed a filling thread insertion point and a filling thread clamping device arranged at the insertion end of the shed and adapted to clamp the filling thread fast behind each shuttle, to convey said filling-thread part to the fell of the cloth, and to hold the filling thread fast until it is woven into cloth, characterized by the fact that the filling-thread clamping device is formed by a tong-like thread gripper having drive means for reciprocating said tong-like gripper along a straight line lying in a central plane of the warp threads, said thread clamping device arrangement comprising an elongated L-shaped guide part and an elongated L-shaped clamping arm swingably supported in said guide part, and the free end of the short arm of said clamping arm is bent around the free end of the short arm of the guide part and, together with the end of the last-mentioned arm, forms the actual clamping part of said thread gripper.

4,071,052
ROTARY REED HAVING FACILITIES FOR ADJUSTABLY SEPARATING GROUPS OF LENO WARP THREADS

Vitezslav Vasek; Pavel Koblizek, and Karel Prazak, all of Usti nad Orlici, Czechoslovakia, assignors to Vyzkumny ustav bavlnarsky, Usti nad Orlici, Czechoslovakia

Filed Sept. 24, 1976, Ser. No. 726,164
Claims priority, application Czechoslovakia, Oct. 3, 1975, 6720/75
Int. Cl.² D03D *47/26, 5/00, 49/68*
U.S. Cl. 139—436 12 Claims



1. In a rotary reed for a travelling wave loom, the reed comprising a reed shaft, a plurality of first relatively thin discs arranged in axially spaced relation at first intervals on the reed shaft for guiding fabric warp threads therebetween, and means including relatively thick second discs disposed on the reed shaft on respectively opposite sides of the first discs, the peripheries of the successive first and second discs along the reed shaft exhibiting angularly offset recesses which cooperate to establish a substantially helical weft-receiving passage, the improvement wherein first and second sets each including at least three of the second discs are arranged on respectively opposite sides of the first discs for guiding a plurality of leno warp threads, each set of the second discs being arranged to define a warp-free zone therein separating selected ones of the leno warp threads so that said selected threads establish, with an inserted weft, a main inner fabric leno weave and a reinforcing outer leno weave separated by a distance greater than the first interval, and wherein variable spacing means are disposed between and in contact with the opposed surfaces of a predetermined pair of adjacent second discs in each set for establishing the warp-free zone therebetween.

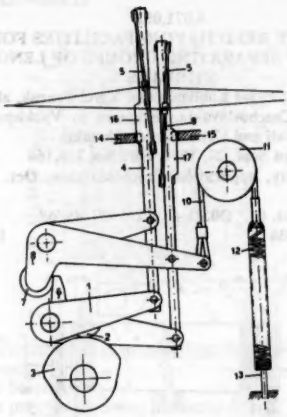
4,071,053
DEVICE FOR THE FORMATION OF THE SHED IN A MULTISHED LOOM

Nicola Santucci, Schio (Vicenza), Italy; Zabotin Aleksandr Aleksandrovic; Loschilin Evghenii Dmitrievich; Galperin Aleksandr Lvovich, and Onikov Eduard Archakovich, all of Moscow, U.S.S.R., assignors to Nuovo Pignone S.p.A., Italy

Filed Sept. 30, 1976, Ser. No. 728,239
Claims priority, application Italy, Oct. 3, 1975, 27954/75
Int. Cl.² D03D *47/26;* D03C *5/00, 13/00*
U.S. Cl. 139—436 3 Claims

1. A device for the formation of the shed in a multished loom having a shaft on which cams are mounted in a cylindrical helix array, said cams being the motive member of the mechanism which has as its purpose to drive the beams carrying the healds which displace the warp threads to obtain the formation of the shed, wherein said device is in one place and includes: matched levers which are separated from each other, cam

means connected to one of said levers for controlling the same, spring means operatively connected to the other of said levers for controlling the same, said levers being maintained in opposing relationship to each other by said cam and spring means,



flexible means interconnecting said spring means and said other lever, and guides positioned beneath the warp threads which operatively cooperate with the healds to give stability to the heald-carrying beams.

4,071,054

DEVICE FOR DISPLACING THE WEFT-CARRIERS IN A MULTISHED LOOM

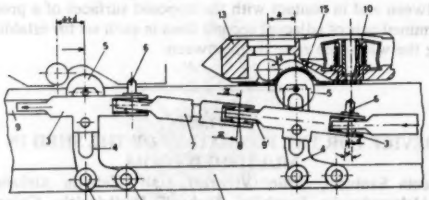
Nicola Santucci, Schio (Vicenza), Italy; Zabotin Aleksandr Aleksandrovic; Loschilin Evghenii Dmitrievich; Galperin Aleksandr Lvovich; Onikov Eduard Archakovich; Sakharov Boris Aleksandrovich, and Borodin Valerian Alekseevich, all of Moscow, U.S.S.R., assignors to Nuovo Pignone S.p.A., Italy and ANIKHBI: Tsentralny Nauchne-issledevatelsky institut khlopchatobumiezhnoi promyshlinnesti, U.S.S.R.

Filed Sept. 30, 1976, Ser. No. 728,240

Claims priority, application Italy, Oct. 3, 1975, 27955/75

Int. Cl.² D03D *47/26*

U.S. Cl. 139—436 **9 Claims**



1. A device for driving shuttles of a weaving loom, comprising an endless chain made up of links interconnected by hinges and including a plurality of carrier links and carriages, wherein each of said carrier links is connected to one of said carriages for driving its carriage around a path in the form of a closed loop, each of said carriages having a drive member for moving a shuttle of the loom, each carrier link having a pin for engagement with a hole in a shuttle, the engagement between each carriage and its carrier link being such as to allow relative movement between said carriage and the said carrier link in a direction transverse to the intended direction of movement of the carriage, chain guide means and carriage guide means for guiding said chain and each carriage, wherein when said chain is driven, each carrier link is guided by said chain guide means into and out of an engagement position in which the said pin of said carrier link is presented for engagement with the hole of the shuttle and during such movement is pivoted to cause the shuttle, when engaged by said pin, to be advanced relatively to the drive member of said carriage.

4,071,055

INSERTING CARRIER FOR LOOMS WITH REMOVAL OF A FILLING YARN FROM STATIONARY BOBBINS

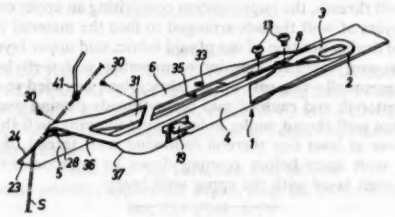
Paul Haltmeier, Brugg; Erhard Freisler, Bubikon, and Willy Rohr, Hinwil, all of Switzerland, assignors to Ruti Machinery Works Ltd., Ruti, Switzerland

Filed Sept. 23, 1976, Ser. No. 726,005

Claims priority, application Switzerland, Sept. 29, 1975, 12575/75

Int. Cl.² D03D *47/22*

U.S. Cl. 139—448 **6 Claims**



1. An inserting carrier for looms with removal of the filling yarn from stationary bobbins, said filling yarn being presented in the carrier in a vertical plane essentially, said carrier having a filling yarn clamping device and a warp divider piece attached to the top of the rear side wall of the carrier facing away from the point of formation of the shed, the upper edge of said divider piece being developed as an ascending first yarn guide curve and passing into an open yarn groove which is covered by a horn which protrudes in a direction away from the point of formation of the shed, characterized by the fact that the filling yarn clamping device is formed from a spring-loaded clamping tongue which is swingable perpendicularly to the central plane of the warp yarn and supported on the bottom surface of the carrier; a second yarn guide curve extending from the rear side wall of the carrier towards the front side wall is connected to the first yarn guide curve; and a third yarn guide curve leads from the horn up to the clamping slot of the clamping tongue.

4,071,056

LANCE DRIVING MECHANISM FOR SHUTTLELESS LOOMS

Amselmo Bolea Camprubi, Barcelona, Spain, assignor to Ingeneria Aplicada, S.A., Barcelona, Spain

Filed June 23, 1976, Ser. No. 698,857

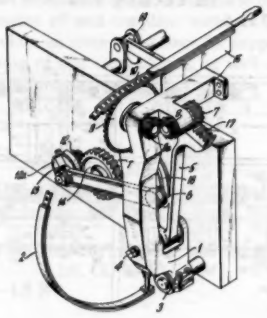
Claims priority, application Spain, June 27, 1975, 213546

Int. Cl.² D03D *47/00*

U.S. Cl. 139—449 **4 Claims**

1. A lance driving mechanism for shuttleless looms comprising a sley mounted for reciprocal pivotal movement, a pivotally mounted sector unit including a sector gear, a lance band mounted on said sley for reciprocating motion relative thereto, lance band driving means coupling said sector gear with said lance band to impart driving motion thereto upon pivotal movement of said sector unit, a connecting rod having a first end and a second end, said first end of said connecting rod being coupled to said sector unit, crank means having said second end of said connecting rod coupled thereto to transmit reciprocal motion to said sector unit through said connecting rod, said crank means being driven to undergo two revolutions

for each stroke of said sley, and a support member mounted for reciprocal pivotal motion with said sley and having mounted thereupon said lance band driving means, said sector unit being



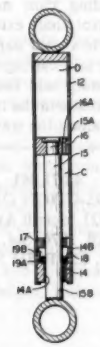
mounted upon said support member for pivotal movement relative thereto about an axis other than the axis of rotation of said support member, said support member including eccentric mounting means for permitting adjustable positioning thereof.

4,071,057

METHOD FOR FILLING GAS INTO SEALED CYLINDER DEVICE

Toshiro Nagase, Sagamihara, Japan, assignor to Tokico Ltd., Japan

Filed July 12, 1976, Ser. No. 704,615
Claims priority, application Japan, July 21, 1975, 50-88999
Int. Cl.[2] B65B *3/04*
U.S. Cl. 141—4 **6 Claims**



1. A method for filling gas into a sealed cylinder device of the type including a cylinder having a closed first end, a rod guide disposed in a second end of said cylinder, a rod slidably extending through said rod guide into said cylinder, and an annular seal sealingly surrounding said rod and sealingly contacting said rod guide; said method comprising:

forming said rod guide to have a cavity including a cylindrical portion sealingly receiving said annular seal and an inwardly divergent portion continuous with said cylindrical portion and opening into the interior of said cylinder;

displacing said annular seal inwardly from said cylindrical portion of said cavity to said divergent portion thereof, to thereby form an annular gap between the outer periphery of said annular seal and the wall of said divergent portion;

filling gas under pressure through said annular gap into the interior of said cylinder; and

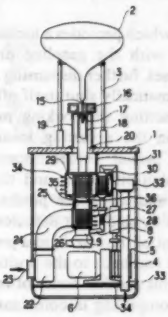
thereafter displacing said rod and thereby said annular seal outwardly until said annular seal contacts the wall of said cylindrical portion of said cavity and closes said annular gap, whereby said annular seal is retained in sealing position within said cylindrical portion by gas pressure within the interior of said cylinder.

4,071,058

PUMPING UNIT FOR TELEVISION TUBES

Michel Albertin, Annecy, and Louis Maurice, Paris, both of France, assignors to Compagnie Industrielle des Telecommunications Clt-Alcatel S.A., Paris, France

Filed Apr. 27, 1976, Ser. No. 680,567
Claims priority, application France, May 5, 1975, 75 13953
Int. Cl.[2] B65B *31/04*
U.S. Cl. 141—65 **6 Claims**



1. In a two stage pumping unit for evacuating tubes terminating in a stem, said unit comprising a frame, an air-cooled mechanical vacuum pump supported by said frame, an oil diffusion pump, a discharge pipe connecting said mechanical vacuum pump and said oil diffusion pump in series with said mechanical vacuum pump acting as a first stage pump and said oil diffusion pump acting as a second stage pump, a suction pipe connected to said diffusion pump and having an inlet for receiving the stem of said tube to be evacuated, said oil diffusion pump including a pump body, a seal surrounding the inlet and an oil vapor baffle carried by said suction pipe and disposed between the inlet and the pump body, a main housing for enclosing said diffusion pump body, said discharge pipe having a portion extending parallel to and to the side of said oil diffusion pump, the improvement comprising: said unit having forced draft generator means for drawing air from a relatively cool region of said frame, and forcing a cooling draft through said first housing across said parallel portion of said discharge pipe extending parallel to said oil vapor baffle, and across said baffle and said suction pipe in the vicinity of the seal surrounding the inlet.

4,071,059

PROGRAMMABLE MANUAL ACTUATOR

William B. Hansel, Media, Pa., assignor to Suntech, Inc., Wayne, Pa.

Continuation-in-part of Ser. No. 672,580, April 1, 1976. This application Aug. 30, 1976, Ser. No. 719,019
Int. Cl.[2] B65B *3/26*
U.S. Cl. 141—206 **26 Claims**

1. In a dispensing nozzle for filling a tank with a liquid where, when the tank becomes filled, the nozzle shuts itself off and an operator can reinitiate gasoline dispensing causing gasoline to be further pumped into the tank which can result in gasoline being pumped into a vapor receiving system, said nozzle being optionally in a storage position in a pump housing or in a dispensing position and having,

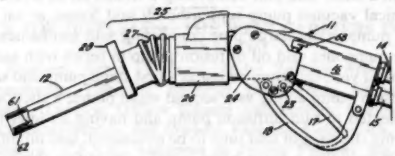
a. a nozzle valve,

b. means for actuating the nozzle valve into an open or closed position;

c. automatic shut-off means, responsive to the liquid in the tank reaching a predetermined level, for placing the actuating means in a disabled condition wherein the nozzle valve cannot be actuated, said shut-off means having an enabling mode wherein the actuating means can actuate the nozzle valve and a disabling mode wherein the actuating means cannot actuate the nozzle valve; and

d. locking means, responsive to the automatic shut-off means obtaining its disabling mode, for locking the actuating means in the disabled condition so that the nozzle valve cannot be actuated by the actuating means, said locking means having the capability of being reset to its normal position by being displaced linearly, wherein the actuating means and automatic shut-off means can function in their normal manner;

the improvement which provides a locking system operating in conjunction with the gasoline dispensing nozzle to prevent, until reset, further dispensing of gasoline after the nozzle has automatically shut itself off comprising a reset actuator for resetting the locking means to its normal position wherein the actuating means can actuate the nozzle valve to permit further dispensing of liquid until the automatic shut-off means and the locking means is actuated again, and wherein a predetermined number of reset operations by said reset actuator is permitted, after which movement of the nozzle to a position for storage in a pump housing and back to the position for dispensing is required to permit another series of reset operations, said reset actuator comprising in combination:



e. a driving element, said driving element having a first position and a second position;

f. a driven element having a first position and a second position, said driven element communicating with the locking means so that when the driven element is in its first position, the locking is in its locked position, and when the driven element is in its second position, the locking means is moved into an unlocked position;

g. at least one motion transferring means for transferring the motion of the driving element to the driven element so that the movement of the driving element from its first position to its second position achieves a corresponding movement of the driven element from its first position to its second position; only when said motion transferring means is in communication with the driving and driven elements to provide a reset operation;

h. means cooperating with said driving and driven elements for removing the motion transferring means from communication with the driving and driven elements when the driven element reaches its second position; and

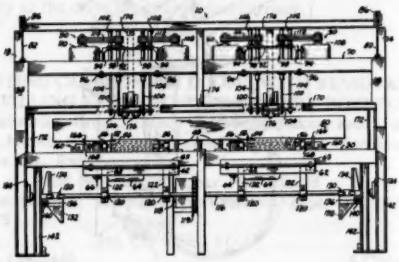
i. means, responsive to the movement of the reset actuator through a predetermined arc and back to its original storage position for dispensing, for placing the motion transferring means into communication with the driving and driven elements, so that a corresponding movement of the driven element takes place in response to movement of the driving element to its second position to reset the locking means.

4,071,060

CROSSTIE ADZING AND BORING MACHINE

Glen D. Busch, P.O. Box 29, Mena, Ark. 71953

Filed Feb. 20, 1976, Ser. No. 659,888
Int. Cl.² B27C 9/04
U.S. Cl. 144—3 H **7 Claims**



1. A railroad crosstie adzing and boring machine, comprising:

a rectangular open type main frame;

rack means extending transversely through said main frame and forming a horizontal travel path for crossties;

adzing means supported by said main frame adjacent the travel path for acting on crossties moved through said main frame;

reciprocable carriage means disposed transversely within said main frame below the travel path for engaging and moving crossties along the travel path in step-by-step fashion;

boring tool means supported by said main frame for vertical movement toward and away from crossties within the travel path; and,

control means including cam means and an eccentric mounted on a control shaft extending longitudinally of said main frame below said carriage means for respectively reciprocating said carriage means horizontally and vertically reciprocating said boring tool means toward and away from a crosstie in the travel path in unison with crosstie movement along the travel path.

4,071,061

ON-SITE CONSTRUCTION OF ROOF TRUSSES

Fredric H. Schneider, 4521 Merrill Ave., Oakland, Calif. 94619

Filed Oct. 20, 1976, Ser. No. 734,335
Int. Cl.² B25H 5/00
U.S. Cl. 144—314 R **19 Claims**

1. Apparatus for constructing a roof truss comprising a truss template which includes roof and base chord defining members having the length and angular relationship of the base and roof chords of a roof truss to be constructed; chord alignment and positioning members secured to said template along said chord defining members adjacent each end of said template, at least

one of which includes a lumber end positioning guide adapted to position at its associated end of said template a first piece of lumber to be used for forming an angled end joint of a roof truss; and lumber positioning stops secured directly to said template chord members at spaced locations to position lumber along the lengths of said template members, whereby said template provides an assembly surface for supporting lumber for construction of said truss chords, as well as defines the length and angular relationship of said chords.

4,071,062

ATTACHMENTS FOR GOLF BAGS

Henry Robert Ianetta, 832 Pendley Road, Willowick, Ohio 44094

Filed June 30, 1976, Ser. No. 701,101
Int. Cl.[2] A63B *55/04*
U.S. Cl. 150—1.5 B **8 Claims**

1. In combination with a golf bag having a bottom, an attachment for enabling the bag to be supported on the ground during selection of a club therefrom, said attachment comprising a holder element secured to the bottom of the bag, and a ground-penetrating element having a head secured to said holder element, said holder element comprising a base plate having depending spaced flanges terminating in inturned flanges which are disposed in a plane parallel with and spaced from said base plate and are spaced from each other, and said ground-penetrating element comprising a head insertable in the space between said base plate and inturned flanges, and a shank extending from said head and downwardly through the space between said inturned flanges, and terminating in a spiked portion.

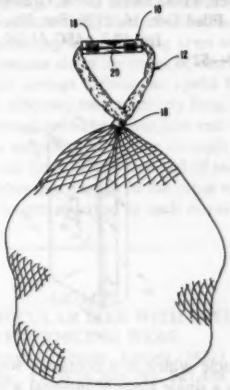
4,071,063

NON-RELEASABLE HAND GRIP FOR PACKAGE OR LOOP HANDLE OF A BAG

Frank B. Russell, Chicago, Ill., assignor to Swift & Company, Chicago, Ill.

Continuation-in-part of Ser. No. 697,141, June 17, 1976, abandoned. This application May 11, 1977, Ser. No. 795,893
Int. Cl.[2] B65D *63/18*
U.S. Cl. 150—12 **14 Claims**

1. An improved hand grip for use on packages having a handle means, said hand grip comprising: a pair of semi-cylindrical portions, said portions being hinged together along a pair of adjacent edges, the convex surfaces of said portions being relatively smooth; and latch means formed on the concave surfaces of said portions adjacent the opposite edges of said portions, said latch means including at least one male member terminating in a pawl and at least one female member having a detent arranged to receive and non-releasably engage said pawl whereby said latch means cooperate to substantially



permanently secure said semi-cylindrical portions together when said portions are closed about said handle means.

4,071,064

PACKING CONTAINER OR RECEPTACLE

Franz J. Saul, Guerzenicher Strasse 61, 5160 Dueren, Germany

Filed May 12, 1976, Ser. No. 685,905
Claims priority, application Germany, May 13, 1975, 2521252; Nov. 5, 1975, 2549604
Int. Cl.[2] B65D *11/20, 37/00*
U.S. Cl. 150—48 **10 Claims**

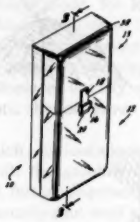
1. A container closure means comprising
a planar wall with an aperture therein for juxtapositioning to the edge region of a wall of a container,
a clip flap that is integral with the edge of said planar wall and is pivotally moveable with respect thereto at a bendline,
an elongated lug, which
1. has one end integral with, and is substantially perpendicular to, the surface of said clip flap which, when said clip flap is in the unpivoted position with respect to said planar wall, faces in the same direction as does the surface of said planar wall to be juxtaposed to said container wall, and
2. is substantially the same distance from said bendline as is said aperture,
and retaining means for causing said lug to resist withdrawal from said aperture when said lug has been inserted therein.

4,071,065

ONE PIECE CONTAINER PARTICULARLY ADAPTED FOR CALCULATORS

Frank Halbich, 11983 Salem Drive, Granada Hills, Calif. 91344

Filed Dec. 16, 1976, Ser. No. 751,119
Int. Cl.² A45C *11/00*
U.S. Cl. 150—52 R **7 Claims**



1. An article which is a container which is formed from substantially a single piece of material which includes a piece of material formed in sections, the sections being joined by hinge parts of the material which is sufficiently thin to allow hinging movement of the material, whereby sections adjacent to a hinge part can be moved relatively with respect to the hinge part, certain of said sections being preformed to constitute portions of a container and to form a container when the sections are moved relatively with respect to a joining hinge part, and a further section being preformed to constitute a closure and moveable relative to a hinge part to provide a closure for a container formed by other sections, there being three sections, which lie in a plane before movement about the hinge parts, said sections including a back section having at least partial side walls and at least a partial bottom wall portion, a front section having at least partial side walls and at least a partial bottom wall portion, said front and back sections being constructed to be moved relatively about a hinge part so that the said partial side walls and partial bottom walls on the front and back sections come into juxtaposed abutting relationship, and a third section forming a cover section attached to the back section by a hinge part, the cover section having a front portion and at least partial side walls constructed to come into juxtaposed abutting relation with partial side walls on the back section with the cover section forming a closure for a portion of the front of the container.

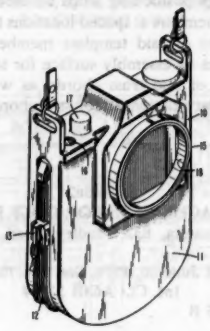
4,071,066

UNDERWATER CAMERA CASING

Merle J. Schaeffer, Silver Spring, Md., assignor to National Geographic Society, Washington, D.C.

Filed Mar. 15, 1977, Ser. No. 777,937
Int. Cl.² G03B *17/56*
U.S. Cl. 150—52 J **6 Claims**

1. An underwater camera casing comprising, a pouch of molded flexible waterproof material having front, back and side walls formed in a contour to provide an upper body space into which a camera may be inserted and a lower body space into which a human hand may be inserted for insertion and placement of a camera body within the pouch, the side wall of said pouch having a side opening extending around the upper and lower body spaces from one side to the other side, a water pressure resistant closure for said side opening, the front wall of said pouch in the upper body space having a lens opening with a relatively hard inner ring surface into which a removable waterproof lens unit may be passed to be detachably secured to a camera body within the pouch thus aligning and



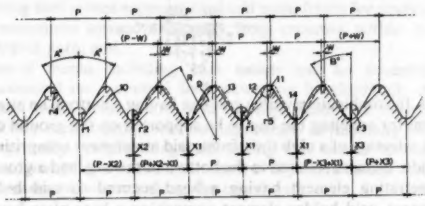
removably securing the camera body within the pouch, and sealing means for said lens opening.

4,071,067

SELF-LOCKING SCREW THREADS

Richard Charles Goldby, Willenhall, England, assignor to Charles Richards Fasteners Limited, Wednesbury, England

Filed Apr. 15, 1976, Ser. No. 677,290
Int. Cl.² F16B *39/30*
U.S. Cl. 151—22 **10 Claims**



1. A screw threaded member having a first portion of thread of a standard form having constant profile, pitch, root diameter and crest diameter, and a second portion of thread of a locking form continuous with said standard portion of thread and having said constant root diameter and constant crest diameter but having a root lead offset from the standard root lead, a crest lead offset from the standard crest lead, the crest offset being greater than the root offset, the flanks of said locking form of thread being displaced from the position of the flanks of thread of said standard form by an amount corresponding to said root and crest lead offsets, a first of the displaced flanks being bulged outwardly, the bulging being greatest in a central region of the flank and decreasing continuously towards the crest and towards the root thereof, the second of the displaced flanks being offset in the direction of said bulged flank.

4,071,068

REMOVABLE TRACK BELT WITH REMOVABLE KEEPER BAR

Richard J. Olsen, Massillon, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

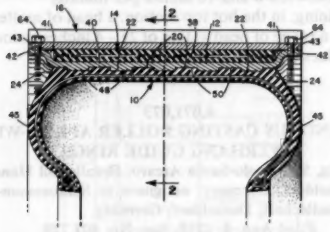
Filed Jan. 5, 1976, Ser. No. 646,621
Int. Cl.² B60C *11/02*
U.S. Cl. 152—176 **23 Claims**

1. A removable track belt assembly for installing about the circumferential surface of a tire carcass comprising:

an annular belt matrix having a plurality of spaced axially oriented recesses in the inner circumferential surface

thereof and further having a first pattern of raised and lowered portions, comprising at least one raised portion or one lowered portion, on the inner circumferential surface thereof to interlock with a complementary pattern of raised and lowered portions on the outer circumferential surface of the tire carcass to prevent relative movement of said belt matrix axially with respect to said carcass;

a plurality of removable keeper bars positioned in said recesses, each of said keeper bars having an inner surface configured so as to be substantially in alignment with the



inner circumferential surface of said belt matrix when said keeper bars are positioned in said recesses and further having a second pattern of raised and lowered portions, comprising at least one raised portion or one lowered portion, on the inner surface thereof to interlock with a complementary pattern of raised and lowered portions on the outer circumferential surface of the tire carcass to prevent relative movement of said keeper bars axially with respect to said carcass;

and means attached to each of said keeper bars for supplying traction to said assembly.

4,071,069

SNOW CHAIN FOR TIRES OF MOTOR VEHICLES FOR QUICK MOUNTING

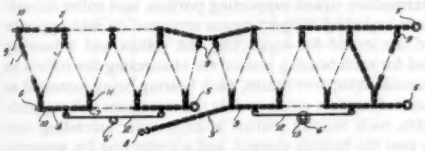
Jernej Raspet, Radovljica, and Marjan Zagar, Jesenice, both of Yugoslavia, assignors to Slovenske zelezarne Tovarna Verig s.p.o., Lesce, Yugoslavia

Filed July 14, 1976, Ser. No. 705,110

Claims priority, application Yugoslavia, July 29, 1975, 1932/75

Int. Cl.² B60C *27/12*

U.S. Cl. 152—213 A **1 Claim**



1. A quick-mounting snow-chain assembly for a motor vehicle tire, comprising:

a continuous inner chain formed at one end with a hook and at its other end with an eye adapted to receive said hook, said inner chain having a length equal substantially to the diameter of said tire along a flank thereof against which said inner chains is intended to lie;

an outer chain comprising a relatively short chain member and a relatively long chain member, and a releasable hook and eye connection between proximal ends of said members, said relatively short chain member having a length approximately equal to half the circumference of said tire along the flank thereof at which said outer chain is intended to lie, said relatively long chain member having a length in excess of half of the latter circumference;

an eye on the free end of said relatively short chain member adapted to receive said relatively long chain member;

a hook on the free end of said relatively long chain member;

a first mounting spring having a pair of arms anchored to spaced apart locations along one of said chain members and a second mounting spring having arms connected to spaced apart locations along the other of said chain members, each of said springs defining an eyelet between the respective arms whereby said relatively long chain member can pass through said eye at the free end of said relative short chain member and thence through one of said eyelets to that said hook at said free end of said relatively long chain member can engage in the other eyelet; and

respective elastic inserts received in each of said eyelets.

4,071,070

MOLDED VEHICULAR TIRE WITH INTERNAL REINFORCING WEBS

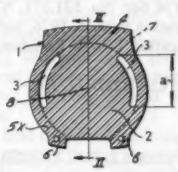
Oskar Schmidt, Chicago 5, Kittsee, Austria (2421)

Filed Mar. 17, 1976, Ser. No. 667,498

Claims priority, application Austria, Mar. 24, 1975, 2302/75

Int. Cl.² B60C *5/00, 17/00*

U.S. Cl. 152—333 **6 Claims**



1. In a molded vehicular tire whose body comprises a toroidal casing with a sole and with a pair of axially separated oppositely outwardly bulging sidewalls bounded by axially spaced annular beads remote from said sole, the interior of said casing being partitioned into a multiplicity of air-filled compartments by as many peripherally separated, generally radial webs,

the improvement wherein each of said webs is integrally attached to said casing only at said sole and in the vicinity of said beads while terminating short of said sidewalls throughout a zone extending from the region of said sole toward said beads past a line of maximum axial spacing of said sidewalls whereby the periphery of each web is separated from said sidewalls in said zone by a pair of arcuate lateral gaps interconnecting adjacent compartments.

4,071,071

TIRE BELT REMOVAL

Thomas W. Graves, and Ronald Seiler, both of Muscatine, Iowa, assignors to Bandag Incorporated, Muscatine, Iowa

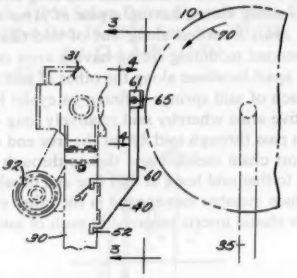
Filed Sept. 21, 1976, Ser. No. 725,159

Int. Cl.² B29H *21/00*

U.S. Cl. 157—13 **12 Claims**

12. Apparatus for preparing a tire for recapping comprising: means for mounting a tire in a vertical plane for rotation about a horizontal axis; a stand movable generally parallel to the tire rotation axis and toward and away from said tire mounting means; a rotatably driven rasp mounted on said stand in a position to contact a tire mounted on said mounting means; an upright knife-supporting frame having a lower end detachably fixed to said stand at a location below the rasp; a straight flat knife extending generally transversely of a tire mounted on

said mounting means and means connecting the knife to the upper end of said frame, said connecting means being adjustable to permit the plane of the knife to be rotatably adjusted about a horizontal axis.



4,071,072

METHOD OF DIRECT CHILL CASTING OF ALUMINUM ALLOYS

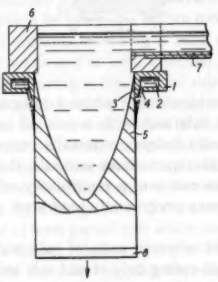
John Gordon McCubbin, Kingston, Canada, assignor to Alcan Research and Development Limited, Montreal, Canada

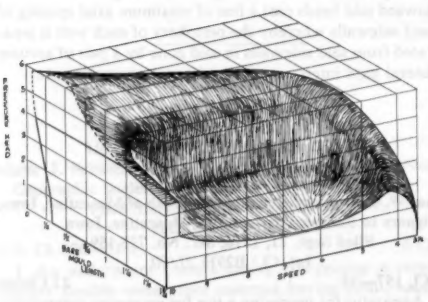
Continuation-in-part of Ser. No. 521,371, Nov. 6, 1974, abandoned. This application Sept. 2, 1976, Ser. No. 719,859

Claims priority, application United Kingdom, Nov. 6, 1973, 51560/73

Int. Cl.[2] B22D *11/16*

U.S. Cl. 164—89 **7 Claims**





1. In a process for the production of smooth-surfaced aluminum ingots by the direct chill continuous casting process comprising the steps of

a. pouring molten metal into an open-ended thermally insulated "hot top" section having a flat bottom surface;

b. allowing the molten metal to descend from said hot top section into a lower chilled mold section axially aligned with said hot top section and bringing said molten metal into contact with said chilled mold section to produce a solidified peripheral layer;

c. withdrawing the metal continuously from the chilled mold section at a predetermined casting rate and applying coolant directly to the surface of the solidified peripheral layer of metal emerging from the chilled mold section,

the improvement which comprises

d. performing steps (b) and (c) with a chilled mold section having a selected vertical extent within a range of values between ½ and ¾ inch, and

e. maintaining said casting rate at a selected value within a range between 6 and 10 inches per minute,

f. maintaining, in the hot top section, a head of molten metal within a range of head values of 2½ – 4 inches according to the values selected in steps (d) and (e).

4,071,073

CONTINUOUS CASTING ROLLER APRON WITH OVERHANG GUIDE RINGS

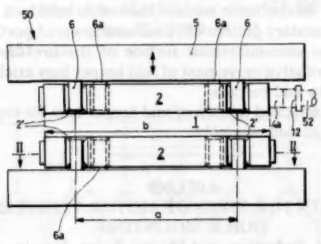
Georg Bollig, Sao Paulo-Santa Amaro, Brazil, and Hans Streubel, Dusseldorf, Germany, assignors to Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Germany

Filed Aug. 4, 1975, Ser. No. 601,720

Claims priority, application Germany, Aug. 16, 1974, 2439359

Int. Cl.[2] B22D *11/12*

U.S. Cl. 164—448 **10 Claims**



1. A roller apron framework for supporting a partially solidified strand on two opposite sides of the strand in a continuous casting installation, especially for the casting of slabs, comprising a plurality of cooperating pairs of rollers, means for mounting each of said rollers within a maximum slab supporting width, each said roller comprising an intermediate strand supporting portion and bearing journals extending outwardly of said intermediate strand supporting portion, said roller mounting means including support means arranged on said opposite sides of the strand for supporting the rollers and a bearing provided for each bearing journal for connecting the rollers to their associated support means, each bearing being mounted at its associated support means within the maximum slab supporting width, each bearing journal of each roller extending outwardly past the bearing thereof, and a guide ring for supporting the strand arranged in an overhang fashion at least at one bearing journal of each roller.

4,071,074

ROLLER APRON FOR A CONTINUOUS CASTING INSTALLATION

Georg Bollig, Sao Paulo-Santa Amara, Brazil; Hans Streubel, and Manfred Kolakowski, both of Dusseldorf, Germany, assignors to Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Germany

Filed June 5, 1975, Ser. No. 584,183

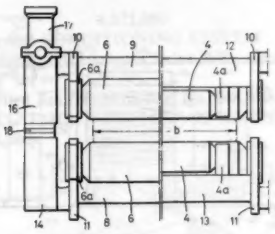
Claims priority, application Germany, June 11, 1974, 2428213

Int. Cl.[2] B22D *11/12*

U.S. Cl. 164—448 **14 Claims**

1. A roller apron assembly for supporting a partially solidified strand at a continuous casting installation, especially for

casting steel strands, comprising a plurality of pairs of cooperating rollers having roller ends and following one another in spaced relationship in the direction of travel of the cast strand, at least one roller pair possessing rollers having a different diameter of its rollers than the diameter of the rollers of another roller pair of said plurality of pairs of cooperating rollers, said pairs of rollers of respectively different diameter following one another in sequence, each of said rollers being rotatably mounted by only two bearings, said at least one roller pair defining larger size rollers each having a strand supporting portion, the bearings of said larger size rollers being mounted



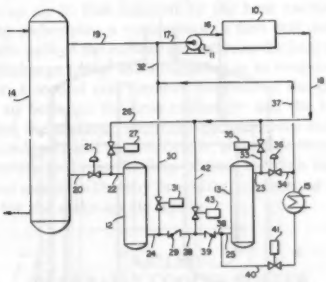
externally of the strand supporting portion, said another roller pair defining smaller size rollers, at least one smaller size roller having at least one of its bearings mounted within the strand supporting portion of the larger size rollers, said at least one smaller size roller having a strand supporting portion extending only between its two bearings such that said strand is adapted to be unsupported outwardly of the said at least one of the bearings of said one smaller size roller, whereby said one smaller size roller is adapted to rely upon the self-supporting effect of the strand edge for supporting the cast strand at that location.

4,071,075

PROCESS AND APPARATUS FOR THE CYCLIC HEATING AND COOLING OF PROCESSING EQUIPMENT

Richard E. Hinkle, Bayshore, N.Y., assignor to American Hydrotherm Corporation, New York, N.Y.

Filed May 26, 1976, Ser. No. 690,166
Int. Cl.[2] F25B *13/00*
U.S. Cl. 165—2 **5 Claims**



1. In a process for heating and cooling user equipment utilizing pressurized water as a heat transfer fluid in a closed system wherein said system includes heating and cooling zones for heating and cooling said heat transfer fluid and wherein said system includes a zone for storing heat transfer fluid at intermediate temperature levels, the improvement comprising:

a. introducing heat transfer fluid from an upper portion of a first storage zone into said user equipment during a first stage of a heating cycle, said heat transfer fluid being at a temperature above the temperature of said user equipment;

b. introducing heat transfer fluid withdrawn from said user equipment into a lower portion of said first storage zone during step (a) thereby upwardly displacing the heat transfer fluid therein;

c. discontinuing the flow of heat transfer fluid to said first storage zone;

d. introducing heat transfer fluid from said heating zone into said user equipment during a second stage of said heating cycle;

e. introducing heat transfer fluid withdrawn from said user equipment during said second stage of said heating cycle into a lower portion of a second stage storage zone thereby displacing heat transfer fluid contained therein;

f. passing said displaced heat transfer fluid of step (e) to said heating zone;

g. switching to said heating zone the flow of heat transfer fluid withdrawn from said user equipment to initiate and finalize said heating cycle;

h. discontinuing the flow of heat transfer fluid to said user equipment from said heating zone at completion of said heating cycle;

i. subsequently introducing heat transfer fluid withdrawn from said user equipment into said upper portion of said second storage zone during a first stage of a cooling cycle thereby downwardly displacing heat transfer fluid therein, said heat transfer fluid being at a temperature below the temperature of said user equipment;

j. withdrawing and passing to said user equipment, said displaced heat transfer fluid of step (i);

k. discontinuing the flow of heat transfer to said second storage zone;

l. introducing heat transfer fluid from said cooling zone into said user equipment during a second stage of said cooling cycle;

m. introducing heat transfer fluid withdrawn from said user equipment during step (l) into said upper portion of said first storage zone therein by downwardly displacing heat transfer fluid therein;

n. passing said displaced heat transfer fluid of step (m) to said cooling zone; and

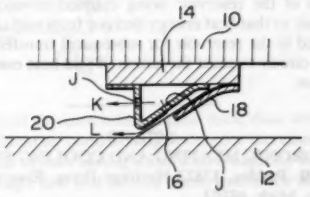
o. switching the flow of heat transfer fluid withdrawn from said user equipment from said first storage zone to said cooling zone to initiate and finalize said cooling cycle.

4,071,076

SEALING MEMBER FOR A ROTARY HEAT-ACCUMULATOR TYPE HEAT EXCHANGER FOR A GAS TURBINE ENGINE

Yoshihiro Sakaki, Suwa, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 20, 1976, Ser. No. 678,652
Claims priority, application Japan, Apr. 21, 1975, 50-47580
Int. Cl.[2] F28D *19/04*
U.S. Cl. 165—9 **7 Claims**



1. In a sealing member for a rotary heat-accumulator type heat exchanger of a gas turbine engine which sealing member includes a sliding plate slidable on a heat accumulator, a shield panel secured to said sliding plate, and a backing plate for

backing said shield panel, said shield panel having a low-temperature side and a high-temperature side, the improvement comprising:

a. an elongate cover defining an interior chamber therethrough constituting a flow path for low-temperature air,

b. said cover extending along the sliding plate and being disposed between said sliding plate and said shield panel at the low-temperature side of the shield panel,

c. said cover extending radially of said heat accumulator and having openings at each end thereof to admit low-temperature and high-pressure air to the interior chamber of said cover and having a plurality of holes such that said air will cool portions of said sealing member.

4,071,077

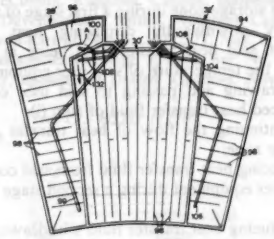
HEATING SYSTEM FOR BUILDING

Gerhard W. Moog, Toronto, and Kenneth R. Cooper, Don Mills, both of Canada, assignors to Canada Square Management Ltd., Toronto, Canada

Division of Ser. No. 579,341, May 21, 1975, Pat. No. 4,049,045. This application Aug. 30, 1976, Ser. No. 718,715

Int. Cl.[2] F24D *11/00*

U.S. Cl. 165—18 **8 Claims**



1. In a system for controlling the temperature of a building having a heating load or a cooling load, the system including: a circulation circuit for a temperature control fluid; means in said circuit for varying the heat energy in said fluid; and means for circulating said fluid in said circuit; the building load being connectible in said circuit so that said fluid can pass through the building load;

the improvement comprising a heat energy storage reservoir containing a fluid, the reservoir comprising a tank having therein a plurality of upright baffles disposed in spaced, generally parallel positions, each baffle extending from the bottom of the tank to a position above the level of the fluid, and from an upright wall of the tank to a position spaced from an opposite upright wall so that the baffles together define an elongate fluid flow path of serpentine form along which the fluid can flow in the form of a column in a generally horizontal direction, the tank having an inlet connection communicating with one end of said path and an outlet connection communicating with the opposite end of said path, said inlet and outlet connections of the reservoir being coupled to said circulation circuit so that heat energy derived from said circuit can be stored in the reservoir for subsequent transfer back to the said circuit to assist the action of said heat energy varying means.

4,071,078

HYDRONIC HEATING AND COOLING SYSTEM

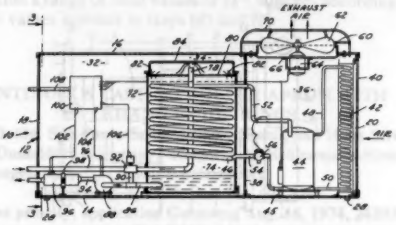
William R. Padden, 13823 Heritage Drive, Riverview, Wayne County, Mich. 48192

Filed Nov. 3, 1976, Ser. No. 738,424

Int. Cl.[2] F25B *29/00*

U.S. Cl. 165—27 **28 Claims**

25. A hydronic heating and cooling system having heating and cooling modes and adapted to be connected to a terminal system to be heated or cooled comprising a chiller tank provided with a water reservoir in the bottom portion thereof, a refrigeration system operative during the cooling mode to cool the water in said chiller tank, said refrigeration system including an evaporator located in said chiller tank above said reservoir, a first conduit adapted to be connected on one end to the terminal system and extending therefrom into said chiller tank at a point below said evaporator, said first conduit including a riser portion extending upwardly through said evaporator and terminating above said evaporator to permit the water therein to be discharged therefrom and gravity fed across the evapora-



tor into said reservoir during the cooling mode, a circulating pump, a second conduit connecting the reservoir in said chiller tank to the inlet side of said pump, a third conduit intersecting said first and second conduits, control valve means for controlling flow in said first and third conduits, a fourth conduit connected on one end to the discharge side of said pump and adapted to be connected on the other end to the terminal system, and heating means for heating the water in said fourth conduit during the heating mode, said heating means being of tubular construction and being interposed in and forming part of said fourth conduit with the water flowing through said tubular heating means during the heating and cooling modes.

4,071,079

HEAT-STORAGE UNIT AND SYSTEM

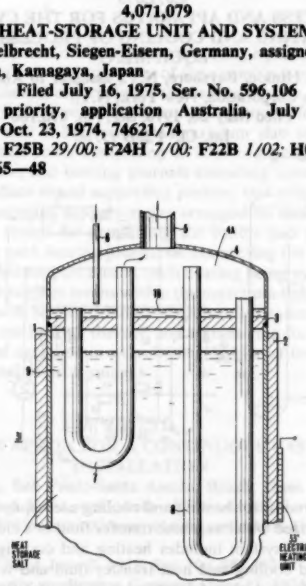
Hans Engelbrecht, Siegen-Eisern, Germany, assignor to Sadao Shimoda, Kamagaya, Japan

Filed July 16, 1975, Ser. No. 596,106

Claims priority, application Australia, July 31, 1974, 71882/74; Oct. 23, 1974, 74621/74

Int. Cl.[2] F25B *29/00*; F24H *7/00*; F22B *1/02*; H05B *1/00*

U.S. Cl. 165—48 **9 Claims**



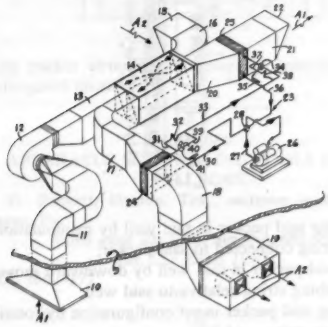
1. A heat accumulator unit comprising an accumulator medium comprising a salt, a container for said medium, means for supplying heat to the accumulator medium, a steam generator

forming a part of said container and having a steam outlet adapted to be coupled to a heat utilization means, said generator including steam generating pipes of different lengths immersed to different depths into the salt, means for feeding water to the steam generator in predetermined quantities, including means for supplying the water inlets of the pipes by overflow, each pipe having a water inlet and a steam outlet, the pipe inlets being so arranged in the steam generator that the pipe with the least immersion depth is supplied by overflow with water first and each successively more deeply immersed pipe is successively supplied with water by overflow with the most deeply immersed pipe supplied last.

4,071,080
AIR CONDITIONING SYSTEM

Frank H. Bridgers, 712 Hermosa Drive, NE., Albuquerque, N. Mex. 87110

Filed Jan. 14, 1976, Ser. No. 648,879
Int. Cl.² F24C *15/20*; F24F *7/00*; A23C *3/02*
U.S. Cl. 165—59 **2 Claims**



1. An air conditioning system for heating and cooling the air in an enclosed area; means for exhausting a portion of the air from the enclosed area; an outlet from which the air exhausted from the enclosed area is discharged; an inlet for supplying ambient make-up air to the system to replace the air discharged; a heat exchanger disposed between the exhaust means and the discharge outlet to enable the exhaust air passing therethrough to treat the make-up air by conduction; means for introducing the treated make-up air to the enclosed area; a heat pump in the system for providing supplemental treatment of the make-up air to that induced by the heat exchanger; said heat pump embodying a compressor; a first coil member disposed in the path of the exhaust air between the heat exchanger and the discharge outlet and alternating as an evaporator and a condenser; a second coil member disposed in the path of the make-up air between the heat exchanger and the blower for introducing the make-up air to the enclosed area and alternating as a condenser and an evaporator; and valve means operating alternately to direct the flow of fluid through the first and second coil members thereby providing heating and cooling as required for the make-up air supply.

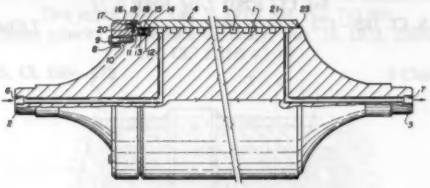
4,071,081
INTERNALLY COOLED ROLLER

Alain Chielens, Marcq-en-Baroeul, and Jean-Pierre Hénin, Lille, both of France, assignors to Fives-Cail Babcock, Paris, France

Filed June 17, 1976, Ser. No. 697,241
Claims priority, application France, June 17, 1975, 75 18833
Int. Cl.² F28F *7/00*
U.S. Cl. 165—82 **7 Claims**

1. An internally cooled roller comprising

1. a roller body having an axis, an axially extending circumferential surface about the axis, a first end face extending substantially perpendicularly to the surface at one end thereof and a second end face, the one end of the circumferential surface having a reduced diameter,
2. a sleeve mounted on the circumferential surface of the roller body and surrounding the surface,
   a. the circumferential roller body surface and the sleeve defining therebetween a conduit for circulating a cooling fluid,
3. a flange fixed on the first end face along a plane extending parallel to the first end face, the flange having
   a. a first tubular member extending perpendicularly to the plane and projecting between the sleeve and the reduced

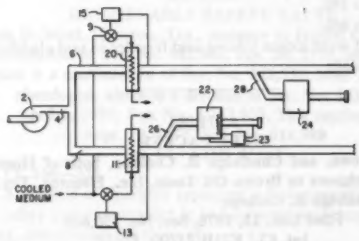


diameter end of the roller body surface, the first tubular member defining a first annular seat with the sleeve and roller body surface, and
   b. a second tubular member of larger diameter than the first tubular member and extending concentrically thereabout, the tubular members defining a second annular seat therebetween, an end of the sleeve projecting into the second annular seat and being gripped thereby to prevent radial expansion of the sleeve end, and
4. a fluid-tight element mounted in the first annular seat and compressed by the projecting first tubular member, the gripped end of the sleeve preventing loosening of the fluid-tight element in the first annular seat.

4,071,082
CONVERSION OF A DUAL DUCT, DUAL TEMPERATURE AIR CONDITIONING SYSTEM TO A SINGLE TEMPERATURE SYSTEM

Leander Economides, New York, N.Y., assignor to Economides & Goldberg, New York, N.Y.

Filed Nov. 17, 1975, Ser. No. 632,765
Int. Cl.² F28F *27/02, 7/02*
U.S. Cl. 165—101 **9 Claims**



7. A method for converting a dual duct, dual temperature constant volume air conditioning system for increased cooling capacity, said system having a fan with a capacity for propelling air through first and second ducts, means for heating the air in said first duct, means for cooling the air in said second duct, and means for mixing the air in said first duct with the air in said second duct in suitable proportions to deliver to a controlled environment air of suitable temperature, comprising:

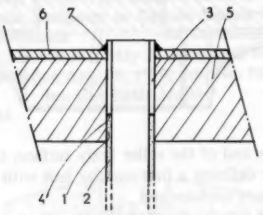
replacing said means for heating the air in said first duct with means for cooling the air in said first duct, and

replacing said means for mixing the air in said first and second ducts in suitable proportions to achieve a desired temperature with terminal means for receiving the air from at least one of said first and second ducts and delivering the air to the controlled environment.

4,071,083
TUBULAR EXCHANGER

René Henri Droin, Saint-Etienne, France, assignor to Creusot-Loire, Paris, France

Filed Mar. 18, 1976, Ser. No. 668,261
Int. Cl.[2] F28D *1/04*; F28F *9/18*
U.S. Cl. 165—173 **7 Claims**



1. A tubular exchanger for working under heat and pressure, comprising a set of tubes made of ferritic steel of high chrome content having the following composition:

C < 0.010%,
Cr: 25 to 30%,
Mo < 4%,

relatively short tubular ferrules of austenitic stainless steel, weld means joining said ferrules respectively to said tubes with a low degree of contamination, said stainless steel of said ferrules having the following composition:

C < 0.020%,
Cr: 20 to 26%,
Ni: 6 to 26%,
Mo: 1 to 5%,

a tube plate receiving said ferrules, said tube plate being clad with an austenitic stainless steel having the following composition:

C < 0.030%,
Cr: 18 to 22%,
Ni: 14 to 18%,
Mo: 1 to 3%,
Mn: 4 to 6%.

and second weld means joining said ferrules to said cladding of said tube plate.

4,071,084
WELL PACKER

Joe R. Brown, and Chudleigh B. Cochran, both of Houston, Tex., assignors to Brown Oil Tools, Inc., Houston, Tex., by said Chudleigh B. Cochran

Filed Dec. 15, 1976, Ser. No. 750,801
Int. Cl.[2] E21B *23/00, 33/12*
U.S. Cl. 166—129 **49 Claims**

1. Apparatus for use in a conduit comprising:

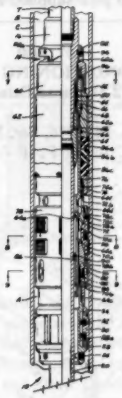
a. sealing means for selectively sealing said apparatus to said conduit by sealing engagement with said conduit;

b. body means including a first component and a second component, and carrying said sealing means, such that said apparatus may be selectively set, with said sealing means in said sealing engagement with said conduit, by non-rotative first phase motion of said first and second components toward each other;

c. mandrel means passing generally through said body means and selectively moveable relative thereto; and

d. tightening means for selectively increasing forces maintaining said sealing means in sealing engagement with said conduit, when said apparatus is set, operable by second phase motion of said first and second components toward each other effected by relative rotational motion between said first and second components.

47. A method of using a packer in a well comprising the steps of:



a. positioning said packer in said well by manipulation of a tubing string connected to said packer;

b. setting said packer in said well by downward movement of said tubing string relative to said well;

c. tightening said packer in set configuration by rotation of said tubing string; and

d. selectively opening and closing a bypass flow passage by said packer in set and tightened configuration by limited longitudinal movement of said tubing string relative to said well.

4,071,085
WELL HEAD SEALING SYSTEM

Donovan B. Grable, 2515 San Francisco Ave., Long Beach, Calif. 90806, and Bill C. Laney, Suite I-308, 4445 Pacific Coast Highway, Torrance, Calif. 90505

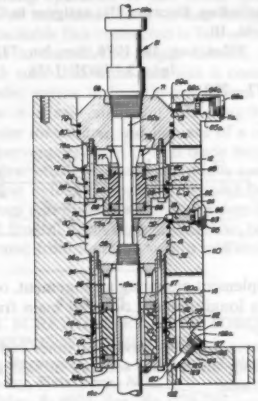
Filed Oct. 29, 1976, Ser. No. 736,721
Int. Cl.[2] E21B *33/03*
U.S. Cl. 166—84 **26 Claims**

1. In well flow control apparatus,

a. a tubular well head having side porting for flowing well production fluid sidewardly through the head, and

b. blow-out preventer means downwardly received in the head interior for controlling the flow of well fluid sidewardly through the head via said porting, said means including generally radially deflectible annular packer structure, and

c. an annular hanger landed in the head and suspending said packer structure, there being a zone in the head and within



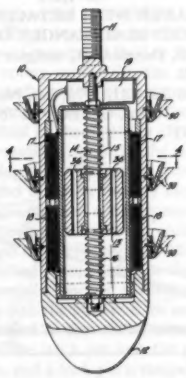
the packer structure to generally centrally receive an elongated member.

4,071,086

APPARATUS FOR PULLING TOOLS INTO A WELLBORE

John D. Bennett, Denton, Tex., assignor to Suntech, Inc., Wayne, Pa.

Filed June 22, 1976, Ser. No. 698,658
Int. Cl.² E21B *19/08*
U.S. Cl. 166—177 **3 Claims**



1. An apparatus for pulling tools down into a wellbore, said apparatus comprising:

a. a shell structure forming the body of the pulling tool, said body having a first, downwardly directed end and a second, upwardly directed end;

b. means connected to the shell for providing physical coupling to the tool;

c. a mass slidably mounted in said shell for sliding movement along the longitudinal axis of said shell between first and second positions disposed nearer said first and second ends, respectively;

d. electromagnetic means for sequentially propelling said mass to said second position at a first average rate of speed and returning the mass back to said second position at a second average rate of speed, said first average rate of speed exceeding said second rate of speed so that the net movement of the pulling apparatus is in the lower or downward direction because of reaction to the movement of said mass; and

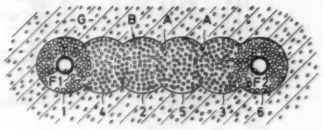
e. at least one fin structure mounted on the outside of said shell structure, said fin structure being designed to offer more resistance to movement of the pulling apparatus in one longitudinal direction than in the opposite direction.

4,071,087

WELL CONSTRUCTION

Kurt Ingerle, Gotzens, and Karl Meister, Simbach, both of Germany, assignors to Ferdinand Aufschlager KG., Munich, Germany

Continuation of Ser. No. 526,937, Nov. 25, 1974, abandoned. This application Aug. 5, 1976, Ser. No. 711,901
Claims priority, application Germany, Nov. 28, 1973, 2359231
Int. Cl.² E21B *43/04*
U.S. Cl. 166—278 **6 Claims**



1. In a method of constructing a filter water well in a region of water-bearing strata which comprises the steps of:

i. sinking in said water-bearing strata a plurality of first cavities and providing a respective lining piping in each first cavity, said first cavities being spaced laterally at a selected spacing;

ii. withdrawing the lining piping from each first cavity and simultaneously filling said cavity with a first gravel filling of a size selected for use as a filter;

iii. thereafter sinking in said water-bearing strata at least one cavity, of width greater than said selected spacing, so as to intersect at least one of said first cavities along the whole of the depth of said first cavities and providing a lining piping in said second cavity;

iv. providing in at least one second cavity a filter pipe which includes in its wall a plurality of openings: the improvement which includes withdrawing the lining piping from said second cavity while simultaneously filling the space of said second cavity externally of said filter pipe with a second gravel filling of a larger size than said first gravel filling.

4,071,088

RETRIEVABLE SAFETY VALVE

James D. Mott, Houston, Tex., assignor to Hydril Company

Continuation of Ser. No. 542,603, Jan. 20, 1975, abandoned, which is a continuation of Ser. No. 363,532, May 24, 1973, abandoned, which is a division of Ser. No. 131,661, April 6, 1971, Pat. No. 3,763,933. This application Sept. 19, 1975, Ser. No. 614,989
Int. Cl.² E21B *43/12*
U.S. Cl. 166—321 **22 Claims**

1. A method of operably replacing a first controlled subsurface safety valve connected in and forming a portion of a well tubing, comprising the steps of:

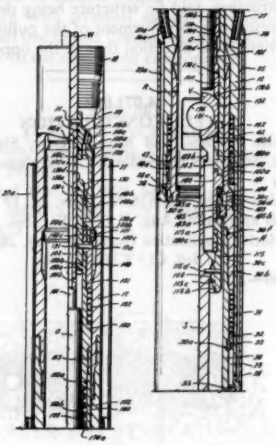
mounting the first controlled subsurface safety valve in the well tubing at a subsurface location in a well;

operating the first controlled subsurface safety valve in response to increased control fluid pressure communicated to the valve by a passageway separate from the well tubing for enabling flow through the well tubing;

moving a second subsurface safety valve into the well tubing when the first controlled subsurface safety valve malfunctions;

positioning the second safety valve within the first controlled subsurface safety valve; and

operating the second safety valve in response to the operation of the first safety valve by the increased control fluid



pressure communicated to the first controlled safety valve.

4,071,089

SOIL CULTIVATING IMPLEMENTS

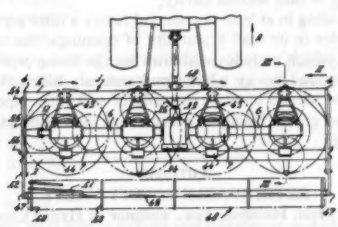
Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

Filed June 2, 1976, Ser. No. 691,986

Claims priority, application Netherlands, June 5, 1975, 7506652

Int. Cl.² A01B *33/06*

U.S. Cl. 172—59 **15 Claims**



1. A cultivator implement comprising a frame and at least one group of soil working members being supported on said frame, each of said soil working members being rotatable about an upwardly extending axis and driving means connected to rotate said soil working members, a ground engaging supporting member being positioned to the rear of said soil working members and said supporting member being interconnected to said frame with setting means that fixes the relative horizontal positions of said frame and supporting member, said group of soil working members being mounted on a substantially horizontal support and said support being pivoted to said frame by at least one linkage, said support together with said soil working members being vertically displaceable about pivot means of the linkage relative to both said frame and said ground engaging member to avoid obstacles during operation, stop means on said implement being positioned to limit the extreme vertical movement of said group of soil working members in at least one direction with respect to said frame.

4,071,090

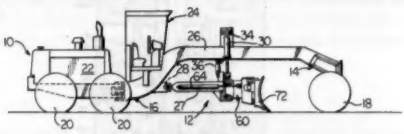
MOTORGRADER IMPLEMENT MOUNTING ARRANGEMENT

Gene B. Easterling, Decatur, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 19, 1976, Ser. No. 715,743

Int. Cl.² E02F *3/76*

U.S. Cl. 172—788 **8 Claims**



1. An implement mounting arrangement, operatively associated with a longitudinally oriented main frame of a vehicle, comprising:

a base frame assembly having an inner end and an outer end and being universally secured at said inner end to said main frame;

first actuator means interconnected between said main frame and said outer end of said base frame assembly for suspended raising, lowering and tilting thereof;

an implement support assembly hingedly mounted on said outer end of said base frame assembly;

angling means interconnected between said base frame assembly and said implement support assembly for angling it relative to the direction of travel of the vehicle; and

second actuator means interconnected between said main frame and said outer end of said base frame assembly for stabilizing and side shifting said base frame assembly.

4,071,091

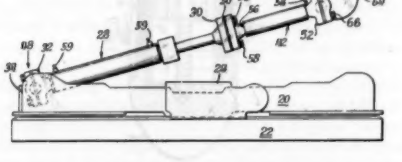
MOTOR GRADER WITH DETACHABLE LINK FOR REDUCED BLADE ANGLE OPERATION

Carlisle S. Morris, Decatur, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed June 21, 1976, Ser. No. 697,903

Int. Cl.² E02F *3/76*

U.S. Cl. 172—797 **10 Claims**



1. In a motor grader which comprises:

a power unit having a main grader frame extending forwardly therefrom, said frame being supported adjacent its forwardmost end by ground engaging means;

a circle drawbar mounted below said frame intermediate said power unit and said ground engaging means;

a circle member mounted below said circle drawbar;

gear means for rotating said circle member relative to said circle drawbar;

a blade mounted to said circle member and therebelow;

first hydraulic cylinder means rotatably mounted at a first end thereof adjacent said frame and at a second end thereof adjacent a periphery of said circle drawbar; said first cylinder means including a rod which is retractible therein, said first cylinder means with said rod fully retracted therein defining a minimum total length;

second hydraulic cylinder means rotatably mounted adjacent a first end thereof adjacent the periphery of said

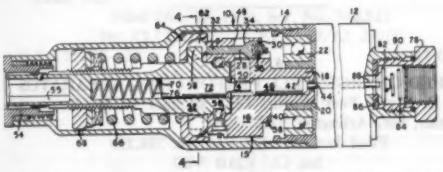
circle drawbar and adjacent a second end thereof adjacent said frame; and an improvement which includes

means for permitting operation of said motor grader at a reduced angle of said blade to a surface being graded, including a detachable link connected in line with said first cylinder means to extend the length thereof, said link having a length such that when said link is connected to said first cylinder means in line therewith and said first cylinder means is at said minimum total length thereof, said first cylinder means and said link are of a collective length which prevents rotation of said blade beneath said frame from a first of said motor grader to a second side thereof, said first cylinder means, when said link is removed therefrom and said first cylinder means is at said minimum total length, allowing said blade to be rotated beneath said frame from said first side to second side.

4,071,092
PNEUMATIC SCREWDRIVER WITH TORQUE RESPONSIVE SHUT-OFF

William K. Wallace, Barneveld, N.Y., assignor to Chicago Pneumatic Tool Company, New York, N.Y.

Filed Mar. 9, 1977, Ser. No. 775,766
Int. Cl.[2] B25B *23/14*
U.S. Cl. 173—12 **7 Claims**



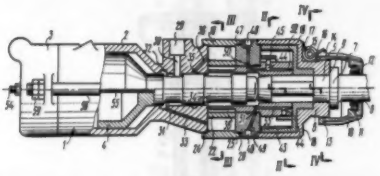
1. In a pneumatically powered screwdriver, a motor housing, a clutch housing affixed to the motor housing, a valve movable to control flow of pneumatic fluid to the motor housing for operation of a rotary motor therein, a push rod for unseating of the valve to allow flow of pneumatic fluid to the motor, a valve spring which is biased to seat the valve to shut off flow of pneumatic fluid to the motor, a clutch member in the clutch housing and rotatably driven by the motor, a spindle in the clutch housing adapted for receipt of a tool bit shank, a plurality of balls arranged to convey rotary motion from the clutch member to the spindle, and a ball compression means urging the balls into engagement with the clutch member, a torque responsive shut-off means for the screwdriver comprising: movable means slidingly supported in the spindle and clutch member, compression means biasing said movable means into engagement with the push rod for unseating of the valve, a latch pin arranged in the clutch member, a spring biased for movement of the latch pin into the path of movement of one of said balls, and a lock pin arranged in the clutch member between the latch pin and the movable means for preventing sliding movement of said movable means, said lock pin responsive to movement of said latch pin caused by said one of said balls to release said movable means for sliding movement to enable said valve spring to overcome the bias of said compression means and seat said valve is seated.

4,071,093
AIR PERCUSSION BORING MACHINE

Anatoly Ivanovich Zubarev, ulitsa Rozybakieva, 362, kv. 1; Lev Fedorovich Osipovsky, 5 mikroraion, 3, kv. 28, and Stanislav Valeryanovich Shipov, ulitsa Dzerzhinskogo, 126, kv. 3, all of Alma-Ata, U.S.S.R.

Filed Sept. 25, 1975, Ser. No. 616,600
Int. Cl.[2] E21C *3/28*
U.S. Cl. 173—105 **4 Claims**

1. An air percussion boring machine comprising: percussion means having a hollow cylindrical housing; a rear head having air distribution means disposed within said housing; a percussion piston located inside said housing for reciprocating under the effect of compressed air and for delivering impacts at the end of the power stroke to a tail piece of the boring tool; a front head disposed coaxially with respect to said percussion piston and said tail piece of the boring tool; a boring tool holder connected to said front head and having a central hole for permitting said boring tool to extend axially outwardly therefrom; a boring tool rotation mechanism, installed in the front portion of the boring machine, having a stator with a plurality of stator blades secured on its internal surface equidistant from each other, a rotor installed inside said stator and provided with a plurality of rotor blades whose number is equal to that of said stator blades, a sleeve installed inside said rotor, a ratchet installed in said front head and coupled to the tail piece of said boring tool for rotating same, at least one pair of hinged



pawls in said sleeve, said pawls of each of said pair of pawls being coupled to each other, and said pawls having a common axle of rotation parallel to the central axis of the boring machine and directed in different senses whereby one of the pawls in each pair is used to rotate said ratchet in one direction whereas the other pawl in each pair is used to rotate said ratchet in an opposite direction, each of said pairs of pawls comprising a rigid coupling in the form of a lug provided on one pawl and a mutually cooperatively associated slot provided on the other pawl; means for urging said pawls to said ratchet comprising air power cylinders with pistons contacting said pawls; and an air pressure source in communication with a first group of air power cylinders designed to rotate said ratchet in one direction when said pawls are in mesh with said ratchet, while a second group of air power cylinders designed to rotate said ratchet in an opposite direction is in communication with the atmosphere.

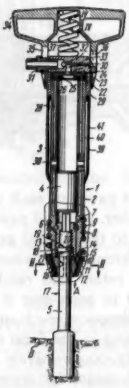
4,071,094
PORTABLE PNEUMATIC PERCUSSIVE TOOL

Viktor Evdokimovich Kilin, ulitsa Posadochnaya, 44, korpus 2, kv. 40; Anas Galimovich Galimov, ulitsa Kuibysheva, 115, kv. 13; Oleg Alexandrovich Yankovsky, ulitsa Soni Morozovoi, 175A, kv. 95, all of Sverdlovsk; Nikolai Alexandrovich Klushin, ulitsa Narodnaya, 1, kv. 23, and Petr Avramovich Maslakov, ulitsa Voskhod, 7, kv. 42, both of Novosibirsk, all of U.S.S.R.

Filed June 21, 1973, Ser. No. 372,416
Int. Cl.[2] B25D *17/04, 17/08*
U.S. Cl. 173—139 **7 Claims**

1. A portable pneumatic percussive tool comprising: a cylinder; a hammer accommodated in said cylinder and adapted to reciprocate under the action of compressed air and to impart blows to a working implement received in the front end portion of said cylinder; an air-distribution means arranged on the rear end face of said cylinder, said means being communicated during the operation of said tool with a compressed air source and adapted to distribute the compressed air provenient from the source; a housing mounted on the rear end part of said cylinder and fixed thereto, said housing being adapted to fix said air-distribution means to said cylinder; a handle mounted on said housing and axially movable within certain limits along the outer surface of said housing, said handle being adapted to control said tool and to communicate said air-distribution means with the compressed air source in the manner known per se during the movement of the handle forwardly along the

housing into the operative position; a shock absorber disposed between said housing and said handle, said shock absorber being adapted to return said handle into the rearmost idle position and to lower vibration of said handle; said working implement being provided at its rear end part with a shoulder adapted to fix the position of said working implement relative to the cylinder; a sleeve composed of a plurality of longitudinally extending parts located on the front end part of said cylinder and embracing said working implement, the outer surface of the sleeve being tapered to converge in the direction toward said working implement, said sleeve being adapted to fix said working implement relative to said cylinder; a differential spring, the end of the spring, which has a greater diameter, being of a cylindrical shape and wound about the front end part of said cylinder, while the end of the spring, which has a smaller diameter, being tapered and being urged against said



tapered surface of said sleeve in the direction toward the rear end of said cylinder so as to urge said sleeve with its rear end face against the front end face of the cylinder and with the inner surface against the outer surface of said working implement, whereby said sleeve together with said spring form a resilient coupling between said cylinder and said working implement, said coupling allowing said working implement to move forward relative to the cylinder at the instant of blow, with working implement being jammed in the material being demolished, due to an additional expansion of said spring, while after the delivery of a blow said coupling contributing to the cylinder movement forwardly toward the working implement due to the contraction of the expanded spring, thereby lowering vibration of the cylinder in the direction toward the operator and reducing the thrust force to be exerted upon the handle.

4,071,095

METHODS OF AND APPARATUS FOR WINNING REEF

Lorne Robert Herron, Benoni, South Africa, and Axel Stromnes, Borlange, Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Apr. 23, 1976, Ser. No. 679,683

Claims priority, application South Africa, Apr. 23, 1975, 75/2609

Int. Cl.² B23Q *5/00*

U.S. Cl. 173—152 **14 Claims**

1. A reef winning machine comprising:

a frame,

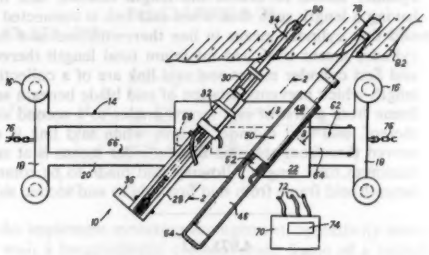
means for fixing the frame in position in a stope,

a saddle on the frame,

moving means coupled to the saddle for moving the saddle along the frame, the moving means including a hydraulic jack coupled to the saddle and means for supplying measured amounts of hydraulic fluid to the hydraulic jack so that the hydraulic jack moves the saddle in substantially equal steps,

a first boom carried by the saddle,

a rock drill mounted on the boom,



means coupled to the rock drill to advance the rock drill forwardly on the boom,

tool carrying means carried by the saddle, and

rock breaker means mounted on the tool carrying means and operating simultaneously with the rock drill.

4,071,096

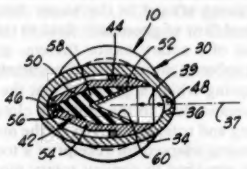
SHAPED CHARGE WELL PERFORATING APPARATUS

Jack E. Dines, Fort Worth, Tex., assignor to Jet Research Center, Inc., Arlington, Tex.

Filed Jan. 10, 1977, Ser. No. 758,299

Int. Cl.² E21B *7/00*

U.S. Cl. 175—4.6 **15 Claims**



1. A shaped charge well perforating carrier which comprises a closed tubular housing adapted to be lowered and raised through tubing in a well bore having at least a portion thereof formed in the shape of an elliptic cylinder so that when shaped charge perforating means disposed therein are detonated, the ellipticity of said elliptic cylindrical portion is reduced.

4,071,097

PROCESS AND APPARATUS FOR SUPERSONIC DRILLING IN UNDERGROUND ROCKY STRATA

Miklós Füllöp, and Géza Rákár, both of Budapest, Hungary, assignors to Koolaj es Foldgazbanyaszati Ipari Kutato Laboratorium, Budapest, Hungary

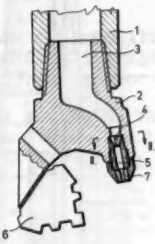
Continuation-in-part of Ser. No. 322,750, Jan. 11, 1973, abandoned. This application May 30, 1975, Ser. No. 582,249

Int. Cl.² E21B *7/04, 9/08*

U.S. Cl. 175—56 **10 Claims**

1. A process for ultrasonic drilling in underground rocky strata with a mechanical drilling tool such as a rotary drill bit containing at least one rock-breaking element, comprising the steps of; making a flushing medium flow through a passageway in the drilling tool; superposing a pressure wave on the static pressure of the flowing medium at the location of rock break-

ing; and setting the frequency of the pressure wave in the ultrasonic range, between 20 and 100 kHz; wherein the frequency of the pressure wave is equal to at least the natural frequency of the at least one rock-breaking element.

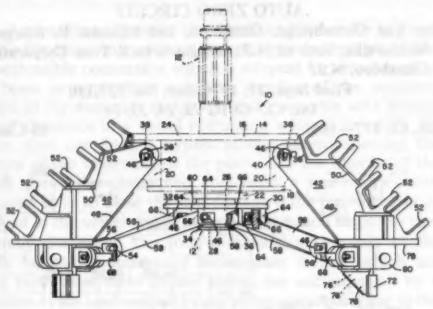


4,071,098

CUTTER MOUNTING EXTENSION APPARATUS

Charles R. Dively, and R. Kenneth Peterson, both of Seattle, Wash., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Oct. 28, 1976, Ser. No. 736,521
Int. Cl.[2] E21B *9/26;* **E21C** *13/12, 23/00*
U.S. Cl. 175—53 **17 Claims**



1. For use in combination with a raise boring head having a drive stem coupled to an earth cutter mounting platform, cutter mounting extension apparatus for extending the effective cutting radius of the raise boring head, comprising:
- a raise boring head radius extension element;
- said extension element having means for replaceably mounting and supporting earth cutters thereon;
- means, having a radial center, for immovably engaging a portion of said raise boring head drive stem;
- means for replaceably fastening said extension element to said earth cutter mounting platform of said raise boring head; and
- strut means replaceably fastening said extension element immovably to said drive stem engaging means.

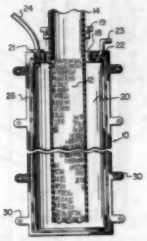
4,071,099

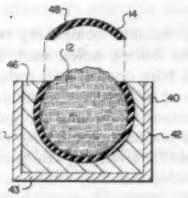
METHOD AND APPARATUS FOR STABILIZING BOREHOLE CORES

Wilber M. Hensel, Jr., Richardson, Tex., assignor to Sun Oil Company, Dallas, Tex.

Filed July 19, 1976, Ser. No. 706,649
Int. Cl.[2] E21B *49/02;* **G01N** *1/02*
U.S. Cl. 175—59 **15 Claims**

1. A method of stabilizing a columnar mass of core material containing fluids therein and encapsulated within an expandable sleeve, said method comprising:
- providing a container for housing an encapsulated core;
- receiving the encapsulated core within the housing;
- supplying a subtemperature mass of material having a temperature substantially less than that of the core;
- introducing the subtemperate mass within the housing and substantially around the core for solidifying the fluids contained therein;
- allowing the core to reach a temperature beneath the freezing point of the fluids contained therein for solidification thereof to permit the core to be handled in a conventional manner without adversely affecting the physical properties thereof; and
- casting the core in a solidifying medium for imparting longitudinal rigidity thereto.





6. Apparatus for utilizing a subtemperature mass to stabilize a columnar mass of core material containing fluids therein and encapsulated within an expandable sleeve, said apparatus comprising:
- an elongated housing adapted for the receipt and containment of the encapsulated core, said housing including at least two longitudinal sections substantially separable one from the other for exposing the encapsulated core therebetween;
- means for introducing a subtemperate mass within said housing and substantially around the core disposed therein for solidifying the fluids contained therethrough; and
- means for providing access to the solidified encapsulated core within said housing for the subsequent analysis thereof.

4,071,100

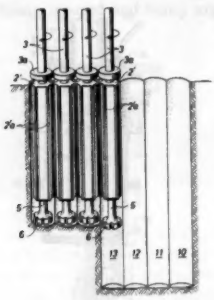
METHOD OF MAKING HOLES OF SELECTED EXTERNAL CONFIGURATION IN PREFERABLY ROCK OR GROUND FORMATION, AND A DRILLING MACHINE FOR CARRYING OUT THE METHOD

Gustaf Hakan Oscar Wibom, Skogsvagen 12, Lidingo, Sweden (181 41)

Filed May 27, 1976, Ser. No. 690,723
Claims priority, application Sweden, May 29, 1975, 7506169; Sept. 30, 1975, 7510957
Int. Cl.[2] E21B *5/00, 7/00, 17/00*
U.S. Cl. 175—69 **16 Claims**

1. A method of making holes of selective external configuration in a rock or earth formation, comprising the steps of providing two or more rotatable drills each provided with drill

crowns, by arranging the drill crowns on drill rods and providing guide means around said drill rods, each drill crown being arranged to drill a hole, which holes together have a smaller total area than the area of the finished hole, positioning the rotatable drills adjacent to each other so that the drill crowns will touch each other or are radially spaced a small distance from each other and positioning the rotatable drills so that the drill crowns are substantially on the same level with each other, driving said rotatable drills into the ground, simultaneously displacing the drill crowns axially while rotating each of the drill crowns about its own axis only, and driving the guide means into the ground substantially simultaneously with the drill crowns.



11. A drilling machine comprising two or more rotatable boring means for boring holes, each of said boring means provided with a bore crown, drill rods, means for mounting the bore crowns on said drill rods, guide means for guiding the drill rods and means for joining the guide means to one another, means for positioning said bore crowns substantially at the same level and for arranging said bore crowns in such close adjacent relationship that they touch each other or are located at a small radial distance from each other, means for driving said bore crowns into the ground, means for axially displacing said bore crowns simultaneously with said driving means, means for rotating each bore crown about its own axis only, and a sinker drill wherein the guide means further comprises means for embracing said sinker drill.

4,071,101

STABILIZER FOR SINGLE OR DUAL TUBE DRILLING

George Alan Ford, Houston, Tex., assignor to Walker-Neer Mfg. Co., Inc., Wichita Falls, Tex.

Filed Mar. 8, 1976, Ser. No. 664,958
Int. Cl.[2] E21B *17/10*
U.S. Cl. 175—325 **8 Claims**

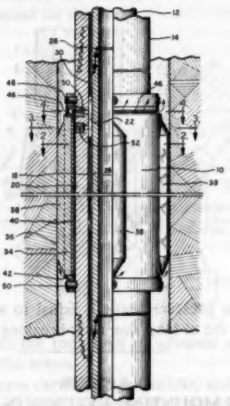
1. A stabilizer for use with a string of dual concentric drill pipe above a tool, comprising:

an inner tubular member adapted for fluid-tight interconnection with the inner pipe of said string to provide a conduit for drilling fluid and cuttings from tool to surface;

an outer tubular member arranged concentrically with said inner member and adapted for fluid-tight interconnection with the outer pipe of said string to provide an annular conduit for drilling fluid from surface to tool;

a stabilizer means encircling said outer member and adapted to contact the hole wall, said stabilizer means including a sleeve bearing mounted to rotate with respect to said outer member and a stabilizer sleeve mounted stationary on said sleeve bearing, said outer tubular member and sleeve bearing forming a clearance space between their adjacent surfaces;

a port means in said outer tubular member providing fluid communication between said annular conduit and said clearance space; and



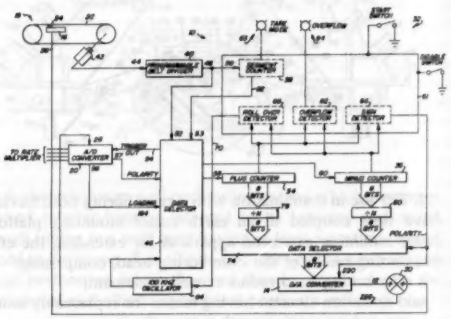
an exit port means in the lower end of the stabilizer means providing fluid communication between said clearance space and the outside of the stabilizer.

4,071,102

AUTO ZERO CIRCUIT

Ron Van Ostenbridge, Glassboro, and Michael E. Sturgeon, Sicklerville, both of N.J., assignors to K-Tron Corporation, Glassboro, N.J.

Filed Sept. 27, 1976, Ser. No. 727,110
Int. Cl.[2] G01G *13/14, 23/14*
U.S. Cl. 177—165 **12 Claims**



1. Apparatus for generating a belt tare compensation signal for use with a load cell in operative contact with a conveyor belt dividable into N equal segments comprising:

first means for generating N loading and N polarity signals, one said loading and one said polarity signal being generated each time said belt advances one said segment, said loading signal being a pulse train representative of the magnitude of the instanteous output of said load cell, said polarity signal indicating whether the output of said load cell is greater than or less than a predetermined value;

second means for generating a difference signal representative of the difference between the number of pulses generated by said first means when said polarity signal indicates that the output of said load cell is greater than said predetermined value and the number of pulses generated by said first means when said polarity signal indicates that the output of said load cell is less than said predetermined value; and

divide by N means responsive to said difference signal for

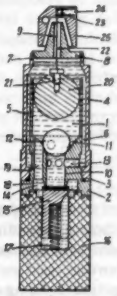
generating a belt tare compensation signal representative of the output of said load cell for a single non-loaded revolution of said conveyor belt.

4,071,103

AUXILIARY DYNAMIC COMPENSATION DEVICES FOR GRAVIMETRIC DISPENSERS

Basile Rouban, Clamart, France, assignor to Trayvou S.A., Vincennes, France

Filed Mar. 11, 1977, Ser. No. 776,779
Claims priority, application France, Mar. 16, 1976, 76 07483
Int. Cl.[2] G01G *23/06*
U.S. Cl. 177—188 **9 Claims**



1. An auxiliary dynamic compensation device for a gravimetric dispenser, comprising a piston suspended by a pliant and non-extensible connection which is adapted for attachment to the beam or equivalent weighing member of the weighing device of the dispenser and is vertically movable with limited lateral clearance in a vessel containing a liquid in which the piston does not float, a bypass passage interconnecting the interior of the vessel below the piston and the interior of the vessel above the piston and containing a non-return valve arranged so as to close the said passage if the piston begins to descend in the vessel and to open it if the piston begins to rise, whereby the piston can follow upward movements of the beam, but those downward movements thereof which are more rapid than those of the piston, are accompanied by a variation in the load applied by the pliant connection due to the retardation of the descent of the piston.

4,071,104

SCALE ADJUSTMENT DEVICE

Leonard J. Macari, Stamford, and Louis T. Canevari, Norwalk, both of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Oct. 26, 1976, Ser. No. 735,581
Int. Cl.[2] G01G *3/08, 23/14*
U.S. Cl. 177—229 **6 Claims**

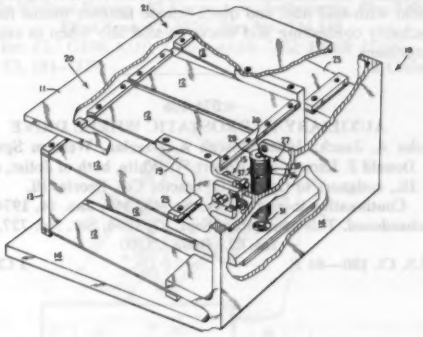
1. In combination, an adjustment spring and a leaf spring scale, said adjustment spring for correcting for differences in spring rates of the leaf springs of the scale which result from differences in manufacturing tolerances, the combination comprising:

a scale support;

a weighing pan for receiving a load to be weighed, said weighing pan moving through at least a portion of a weighing range in response to said load;

a first and second leaf spring means operatively connected together for forming and effectively functioning as a unitized leaf spring means, said weighing pan being supported by said first and second leaf spring means, said first and second leaf spring means being carried by said scale support; and

an adjustment spring means operatively connected between the movable weighing pan and the scale support, said adjustment spring means including a coil spring having a spring support means on one end thereof, a screw thread means affixed to the spring support means, said screw thread means extending through a middle portion of said coil spring, an adjustable rotative nut-type element rotatively disposed upon said screw thread means and extending between coil elements of said coil spring, the nut-type element being rotatively adjustable to different positions



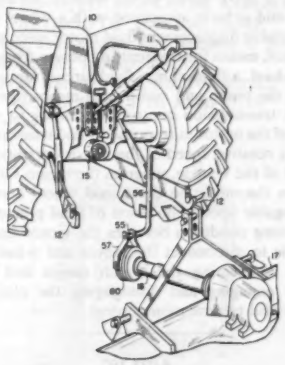
upon said screw thread means to vary an effective working length of said coil spring, and hence, to vary a spring rate of said coil spring, whereby the adjustment spring means in combination with said first and second leaf spring means can effectively adjust an overall spring rate of the scale and correct for inherent differences due to manufacturing tolerances of said first and second leaf spring means.

4,071,105

COUPLING DEVICE FOR A POWER TRANSMISSION SHAFT

Wilhelm von Allwörden, Lohmar, Germany, assignor to Jean Walterscheid GmbH, Lohmar, Germany

Filed Aug. 23, 1976, Ser. No. 716,835
Claims priority, application Germany, Aug. 23, 1975, 2537601
Int. Cl.[2] B60D *1/08*
U.S. Cl. 180—14 R **9 Claims**



1. A device for releasably coupling a power take-off shaft of a tractor to a transmission shaft of a trailer towed by said tractor, said device comprising a coupling hub, means drivingly mounting said hub on said power take-off shaft, a coupling drum co-axially surrounding and spaced from said hub, said drum being substantially fixed relative to said tractor, a pivot support mounted on an outer surface of said drum, a coupling sleeve drivingly mounted on said transmission shaft, a

first arm having a first end, means for pivotally connecting said first end to said sleeve, an actuating member non-rotatably connected to the other end of said first arm, a second arm having a first end non-rotatably connected to said actuating member, the other end of said second arm extending from said member whereby when said actuating member is positioned on said pivot support, pivotal movement of said second arm about the axis of said support will move said sleeve to a position co-axially between said hub and said drum for driving engagement with said hub, and quick-release fastener means for detachably connecting said sleeve to said hub when in said engagement.

4,071,106

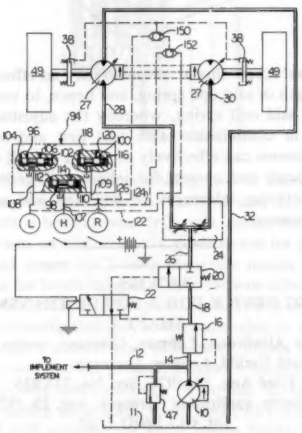
AUXILIARY HYDROSTATIC WHEEL DRIVE

John A. Junck, Joliet; Joseph A. Dezelan, Western Springs; Donald J. Larson, and Robert W. White, both of Joliet, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Continuation-in-part of Ser. No. 432,968, Jan. 14, 1974, abandoned. This application Sept. 27, 1976, Ser. No. 727,187

Int. Cl.[2] B60K *25/00*

U.S. Cl. 180—44 F **3 Claims**



1. In a vehicle having a variable transmission control for determining a drive speed of the vehicle, an auxiliary drive system for said vehicle associated with a wheel thereof comprising a variable displacement fluid motor associated with said wheel thereof, means for transmitting power from the motor to drive the wheel, a fluid pump, fluid circuit means operatively connecting the pump and motor, and means operatively connecting the transmission control and motor to vary the displacement of the motor in response to said transmission control to provide a rotative speed of the motor corresponding to the drive speed of the vehicle, wherein the means for transmitting power from the motor to drive said wheel comprise clutch means engagable upon application of fluid pressure thereto to effect a driving condition between the motor and wheel, and disengagable to disconnect the motor and wheel, and means operatively connecting the clutch means and transmission control for engaging and disengaging the clutch means in response to said transmission control.

4,071,107

ENGINE SIDE GUARD MOUNTING

Conard E. Leighty, Metamora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

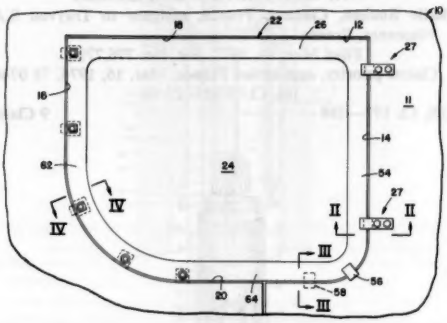
Filed Sept. 27, 1976, Ser. No. 727,188

Int. Cl.[2] B62D *25/12*

U.S. Cl. 180—69 R **12 Claims**

1. In an engine compartment of a vehicle which includes an opening through a sidewall thereof and a panel secured to cover said opening and removable to allow access to components within said compartment, an improved means for mounting said panel to said engine compartment, comprising:

a metallic plate rigidly affixed to a first side of said sidewall, and having a portion thereof extending to the vicinity of said opening; and



a metal leaf rigidly affixed to a second side of said sidewall, and having a portion thereof extending to the vicinity of said opening in alignment with and a spaced distance from said extending plate portion, said extending leaf portion and extending plate portion defining a mouth for accepting said panel, said spaced distance being smaller than the thickness of said panel thereadjacent.

4,071,108

STEERING SYSTEM FOR ARTICULATED VEHICLES

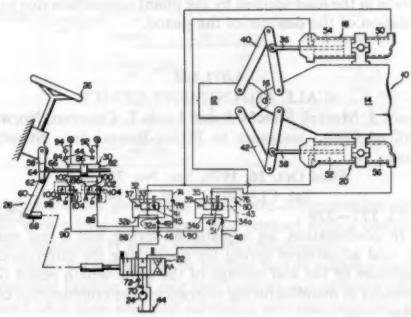
Akio Iida, Kawasaki, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Continuation-in-part of Ser. No. 673,942, April 5, 1976, abandoned. This application Dec. 22, 1976, Ser. No. 753,227

Claims priority, application Japan, Apr. 4, 1975, 50-44792[U]; Apr. 4, 1975, 50-44793**[U]**

Int. Cl.[2] B62D *5/06*

U.S. Cl. 180—139 **9 Claims**



1. In a steering system for an articulated vehicle having a forward portion and a rearward portion pivotally connected to each other, wherein the steering system includes fluid actuated steering cylinder means adapted to cause angular motion of the forward portion of the vehicle relative to its rearward portion as dictated by a steering member, the combination thereof with:

a source of fluid under pressure;

a steering control valve adapted to control communication between said source and said steering cylinder means, said steering control valve being normally held closed in a

center position and displaced on actuation to either of two offset positions;

linkage means operatively connecting said steering member to said steering control valve whereby said steering control valve is actuated by said steering member;

a fluid actuated follow-up cylinder having a piston operatively connected to said linkage means via a piston rod, said follow-up cylinder having a pair of opposed fluid chambers;

locking means for normally locking said piston of said follow-up cylinder against movement in either direction; and

follow-up cylinder actuating means operatively connected between said steering control valve and said steering cylinder means to selectively supply fluid under pressure to said fluid chambers of said follow-up cylinder upon actuation of said steering cylinder means, said locking means being adapted to unlock said piston of said follow-up cylinder when the fluid pressure in either of its fluid chambers builds up to a predetermined degree;

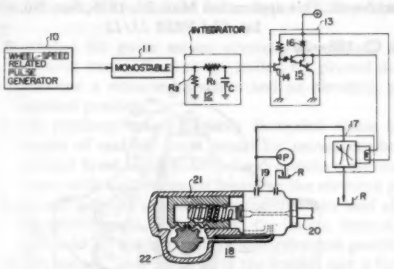
whereby said follow-up cylinder when actuated by said actuating means functions to cause said linkage means to return said steering control valve to its center position.

4,071,109

POWER STEERING CONTROL WITH DAMPING ACTION AGAINST RAPID CHANGE IN VEHICLE SPEED

Mitsuhiko Ezoe, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Japan

Filed July 19, 1976, Ser. No. 706,377
Claims priority, application Japan, July 17, 1975, 50-86651
Int. Cl.[2] B62D *5/08*
U.S. Cl. 180—143 **6 Claims**



1. In a wheeled vehicle hydraulic power steering system including a source of pressurized working fluid and a power steering unit supplied with said working fluid to give increased power to steering operation, a control apparatus for preventing a sudden relief of thrust on a steering shaft in response to sudden acceleration or deceleration of the vehicle, comprising:

means for generating an electrical signal of which the magnitude is representative of the speed of rotation of the vehicle wheels;

a timing circuit having a capacitor, a charge circuit for charging the capacitor with said electrical signal, and a discharge circuit for discharging the energy stored in said capacitor when said signal falls below the voltage developed across said capacitor, the time constant values of said charge and discharge circuits being such that the voltage developed across said capacitor varies at a rate lower than the minimum rate at which the speed of said vehicle wheels varies in response to sudden acceleration and deceleration of the vehicle;

an electromagnetically operated control valve for regulating the flow of said working fluid supplied to the power steering unit in response to an electric current supplied thereto; and

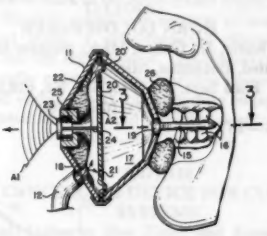
amplifier means including a field-effect transistor having a control gate connected to said capacitor for providing amplification of said voltage developed across said capacitor and a current amplifier connected to said field-effect transistor for providing an electric current in response to said amplified voltage to operate said control valve.

4,071,110

UNDERWATER VOICE COMMUNICATOR

Philip Wallace Payne, 157 Cocoa Ave., Indiatlantic, Fla. 32903

Filed Sept. 17, 1976, Ser. No. 724,349
Int. Cl.[2] G10K *9/10, 11/02*; A62B *7/02*; H04R *25/00*
U.S. Cl. 181—127 **8 Claims**



1. An underwater voice communicator including, in combination:

a. means defining an air chamber for communication with a diver's mouth so that the diver can speak into said chamber;

b. an acoustically responsive air diaphragm in said chamber;

c. an emitter means carried by said air chamber and having a sound emitting surface in direct physical contact with the surrounding water when said air chamber is submerged; and,

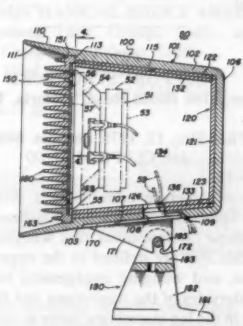
d. mechanical means physically connected to said diaphragm and emitter to transform acoustical energy from said diaphragm to said emitter in a manner to approach an acoustical impedance match between acoustic energy absorbed by said diaphragm in said air chamber and acoustic energy generated in the surrounding water by said emitter means.

4,071,111

WEATHERPROOF LOUDSPEAKER ASSEMBLY AND METHOD OF MAKING SAME

Robert E. Croup, Indianapolis, Ind., assignor to Acoustic Fiber Sound Systems, Inc., Indianapolis, Ind.

Filed Apr. 28, 1976, Ser. No. 681,022
Int. Cl.[2] H05K *5/00*; A47B *81/06*
U.S. Cl. 181—149 **32 Claims**



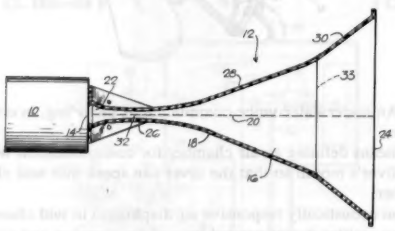
1. A weatherproof loudspeaker assembly comprising a housing formed of water-impermeable material and having an aperture therein to facilitate the emission of sound waves there-

from, corrugated material disposed within said housing and lining at least a substantial portion thereof with two layers of corrugations arranged to facilitate suppression of undesirable sound waves in said housing, loudspeaker means disposed within said housing and said corrugated material and having a water-repellent front portion, and means mounting said loudspeaker means on said housing with said water-repellent front portion closing said aperture and forming a watertight seal between said front portion and said housing around the entire perimeter of said aperture, thereby to render said loudspeaker assembly watertight.

4,071,112
HORN LOUDSPEAKER

D. Broadus Keele, Jr., Galien, Mich., assignor to Electro-Voice, Incorporated, Buchanan, Mich.

Filed Sept. 30, 1975, Ser. No. 618,077
Int. Cl.[2] G10K *11/00*
U.S. Cl. 181—187 **17 Claims**



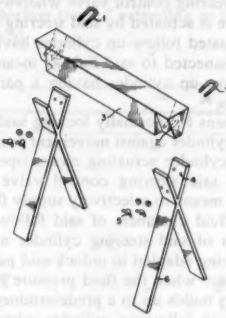
1. A loudspeaker comprising a driver for generating sound waves over a range of frequencies having a sound outlet port, and a horn having a channel extending therethrough from an inlet end to a mouth, said horn being mounted on the driver with the inlet end of the channel acoustically sealed on the port of the driver, the channel having a first portion extending from the driver and a second portion extending from the first portion, the first portion of the channel having a throat of minimum cross section adjacent to the port of the driver, the second portion of the channel of the horn having cross sectional areas increasing as the square of the distance from the first portion of the channel, said first and second portions of the channel having substantially the same cross sectional area at the interface of said first and second portions, and the cross sectional area of the first portion of the channel increasing with distance from the throat of the channel at a rate of increase increasing with distance from the throat of the channel from a rate less than the rate of increase of the second portion of the channel at the interface between the first and second portions of the channel.

4,071,113
SUPPORT STRUCTURE

Eric W. Pelser, 1160 Heald Road, Victoria, British Columbia, Canada

Filed Dec. 12, 1975, Ser. No. 640,243
Int. Cl.[2] F16M *11/00*
U.S. Cl. 182—181 **1 Claim**

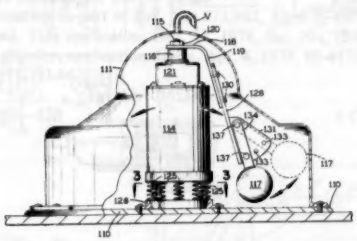
1. A support structure comprising a cross-beam and leg assemblies, wherein the cross-beam is reduced in its end portions in the shape of trapeziums that wedgingly engage Vee-shaped crotches that are defined in the upper portions of the leg assemblies, said wedging engagement leaving spaces between the undersides of the trapeziums and the bottoms of the Vee crotches in the leg assemblies, holes in said cross-beam end portions and said upper portions of said leg assemblies, and U-bolts having an angle of entry through said holes that bears an oblique relationship to one inclined face of each trapezium and a 90° relationship to the opposite inclined face of each trapezium, and wherein wing nuts engage the protruding ends of each U-bolt adjacent to the inclined trapezium face that bears said 90° relationship, wherein all the components are locked into a rigid assembly.



4,071,114
MOTION OPERATED POWER APPARATUS

Enos L. Schera, Jr., 8254 S.W. 37 St., Miami, Fla. 33155

Continuation-in-part of Ser. No. 566,027, April 7, 1975, abandoned. This application Mar. 26, 1976, Ser. No. 670,697
Int. Cl.[2] F03B *13/12*
U.S. Cl. 185—30 **7 Claims**



1. In an apparatus for converting fluctuating movements into useful work comprising:

a base adapted to rock in response to fluctuating movements;

a shaft-driven power device supported from said base and extending above said base;

and a rotatable input shaft extending up from said power device and operatively coupled in driving relationship to the latter;

the improvement which comprises the combination of:

a weight located off-center from said input shaft and closely above said base at an elevation substantially closer to the base than to said input shaft;

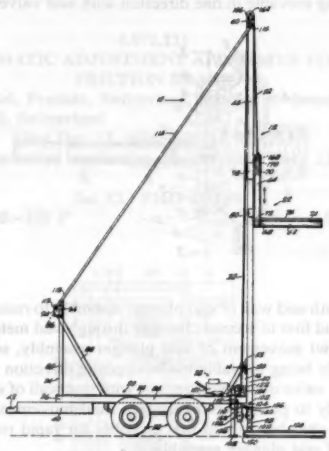
a rigid coupling arm connected to said input shaft above said power device and extending laterally outward from said input shaft across the top of said power device and downward to one side of said power device, said coupling arm at its lower end carrying said weight so that the weight revolves about the axis of the input shaft and imparts rotation to the input shaft in response to rocking of the base, said weight having an unobstructed path through which it can revolve about the axis of the input shaft; and

yieldable means mounting said power device on said base.

4,071,115
MULTI-STORY LIFT DEVICE

Frank Garcia, 3047 Terrace Ave., Naples, Fla. 33942

Filed Apr. 1, 1976, Ser. No. 672,525
Int. Cl.[2] B66B *9/20*
U.S. Cl. 187—2 5 Claims



1. A multi-story lift device for attachment to a trailer of the type including a main frame, a bed, a wheel assembly supporting the main frame and bed, and a tongue and hitch means for attachment to a tow vehicle for over-the-road travel, comprising:

elongated lift guide means pivotally connected to a first support means, fixed to the trailer, for pivotal movement between a retracted position and an elevated, generally vertical position,

a lift platform means slidably journaled along the main length of said lift guide means for movement between a ground level, load position and selective elevated positions, with said lift guide means in the elevated position,

a second support means for engagement by said elongated lift guide means, intermediate the length thereof, to support said lift guide means in said retracted position,

winch means, fixed relative to the trailer, and a first cable, operably attached between said winch means and a lower end of said elongated chain means to pivot said elongated guide means between said retracted and elevated positions, and a second cable, operably attached between said winch means and said lift platform means to move said lift platform means between said ground level, load position and selective elevated positions, and

reversible drive means, drivingly connected to said winch means,

said elongated lift guide means comprising a pair of spaced apart, parallel, elongated beams, interconnected by transverse beams at their respective upper and lower ends,

said lift platform means being generally L-shaped in side elevation and including a first pair of spaced apart, parallel beams, parallel with and in close proximity to the respective lift guide beams, a second pair of spaced apart, parallel beams, fixed to and extending outwardly from said first pair to define said L-shape, a platform, fixed in a spanning relation to said second pair, and a plurality of transverse tie beams connecting between said first and second pairs,

said lift guide beams being tubular and including a pair of tubular segments enlarged somewhat in cross section relative to said lift guide beams for respective attachment as by welding to the upper end portions of said first pair in positions for sliding engagement along said lift guide beams,

said device including a pair of generally C-shaped segments, fixed to the respective lower end portions of said first pair and being sized and configurated in cross section for a stabilizing, sliding engagement along said lift guide beams,

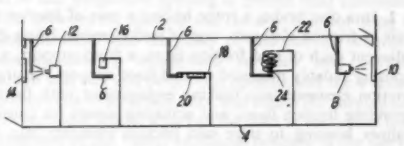
said first support means comprising a first pair of spaced apart vertical posts, fixed relative to respective rear end sides of the trailer and said pivotal connections comprising a transverse pivot pin extending through the upper end portion of each of said vertical posts and an ear, fixed as by welding to each of said lift guide beams somewhat inwardly of said lower ends thereof, and

said second support means including a second pair of vertical posts fixed at lower ends to front end portions of respective sides of the main trailer frame, and a transverse post, fixed in a spanning relation to said second pair of vertical posts, a predetermined distance downwardly from the top ends thereof, said transverse post including outwardly extending end portions beyond the respective second vertical posts for supporting engagement with said elongated beams in said retracted position.

4,071,116
LOAD CANCELLING DEVICE FOR CONVEYANCE SYSTEMS

Levi Ytzhak Halperin; Dov Zioni, and David Bennet, all of Jerusalem, Israel, assignors to Shaare Zedek Hospital, Jerusalem, Israel

Filed Nov. 6, 1975, Ser. No. 629,365
Claims priority, application Israel, Nov. 12, 1974, 46035
Int. Cl.[2] B66B *1/32*
U.S. Cl. 187—29 R 10 Claims

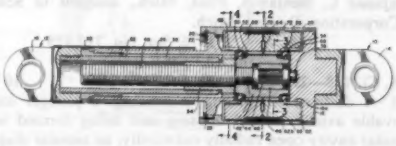


1. A load-cancelling system, for conveyance systems having a power source, driving means and braking means, said load cancelling system being adapted to cancel the effect of a load weight on the requirements from the power source and comprising at least one weighing device adapted to determine the weight of the load on the conveyance, a supplementary braking device adapted to dissipate energy supplied to the system by the load and interface means between said devices for translating the result of the weighing operation to a corresponding braking operation.

4,071,117
MECHANICAL SHOCK ARRESTOR

Elmer Chensheng Yang, Orange, Calif., assignor to Pacific Scientific Company, Anaheim, Calif.

Filed Mar. 10, 1977, Ser. No. 776,397
Int. Cl.[2] F16F *7/10*
U.S. Cl. 188—1 B 23 Claims



1. A motion snubbing device comprising:

a pair of members mounted for relative movement;

a pair of inertia elements mounted to be freely rotated;

means connecting said members to said elements so that relative movement of said members in one direction will drive one of said inertia elements, and relative movement

of said members in an opposite direction will drive the other inertia element; and

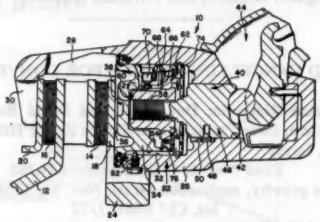
means connecting said inertia elements in a manner such that rotating either of the elements below a predetermined motion threshold causes such element to rotate the other inertia element, and attempting to rotate said other inertia element above said threshold initiates braking action on said elements and said members which limits motion to said threshold.

4,071,118

VARIABLE ADJUSTER FOR DISC BRAKE

Donald Dixon Johannesen, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Filed Oct. 22, 1976, Ser. No. 734,909
Int. Cl.[2] F16D 65/56
U.S. Cl. 188—71.9 **3 Claims**



1. In a disc brake, a rotor having a pair of friction faces, a pair of friction elements, one of said elements being disposed adjacent each of said friction faces, a fixed support, a caliper housing slidably mounted on said fixed support for urging the friction elements into braking engagement with their corresponding friction faces, and actuating means for causing said caliper housing to urge said friction elements into braking engagement with said friction faces, said actuating means including automatic adjustment means for limiting retraction of said piston to a predetermined running clearance, said adjustment means including an extensible member comprising a pair of relatively rotatable components, and a ratchet mechanism for rotating one of said components relative to the other component, said ratchet mechanism including a pivoting pawl and a toothed member for engagement by the pawl, said pawl including a pair of keys axially facing the toothed member and engageable therewith to rotate said one component a predetermined increment when one of said pair of keys engages the toothed member and a second predetermined increment when the other of said pair of keys engages the toothed member, caused by movement of said toothed member axially away from said pawl and said pair of keys being rotationally disposed to each other relative to the pivot of said pawl so that said pair of keys are engageable with the toothed member separately.

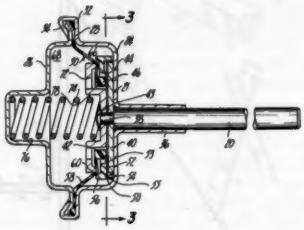
4,071,119

DASHPOT ASSEMBLY

Benjamin C. Benjamin, Flint, Mich., assignor to Schmelzer Corporation, Durand, Mich.

Filed Aug. 9, 1976, Ser. No. 712,925
Int. Cl.[2] F16F 9/04
U.S. Cl. 188—298 **10 Claims**

1. A dashpot comprising; a housing, a plunger assembly movable axially in said housing and being formed with an annular cavity open radially outwardly, an annular diaphragm having its outer periphery connected to said housing in fluid tight relationship, said plunger having an annular wall in said cavity, an annular valve formed at the inner periphery of said diaphragm and being disposed in said cavity for engagement with said annular wall to form first and second fluid chambers on opposite sides of said diaphragm, a metering notch formed in said annular wall of said plunger assembly and extending radially between said valve and wall to permit continuous restricted fluid communication between said first and second chambers, a ring positioned for limited movement relative to said plunger assembly between said diaphragm and said annular wall at the outer periphery of said plunger assembly to maintain said annular valve in said cavity, said plunger assembly being movable in one direction with said valve in engagement with said wall of said plunger assembly to resist fluid flow from said first to second chamber through said metering notch to restrict movement of said plunger assembly, said plunger assembly being movable in the opposite direction to flex said annular valve out of engagement with said wall of said plunger assembly to permit relatively free fluid movement from said second chamber to said first chamber for rapid return movement of said plunger assembly.



4,071,120

SLACK ADJUSTER FOR CAM BRAKES

Faust Hagin, Fortnerstrade 35/I, 8000 Munich 45, Germany

Filed Sept. 5, 1975, Ser. No. 609,890
Claims priority, application Germany, Sept. 7, 1974, 2443004
Int. Cl.[2] F16D 65/52
U.S. Cl. 188—79.5 K **18 Claims**

1. In an apparatus for adjusting a predetermined clearance between a brake shoe (37) and a corresponding brake drum (38), including a housing rotatable about an axis, actuating lever means (1) forming part of said housing, a worm wheel (6) journalled in said housing, brake adjusting means (7) operatively interposed between said worm wheel (6) and said brake shoe (37), shaft means (4) journalled in said housing and having a free end, worm means (5) supported by said shaft means for meshing engagement with said worm wheel (6), force transmitting means including a force limiting member operatively arranged to respond to a movement of said lever means rotating said housing about said axis (2) for rotating said worm means, the improvement wherein said force transmitting means comprise a one-way clutch mechanism and linkage means (8, 15, etc.) operatively arranged to transmit a rotational movement of said actuating lever means and thus of said housing through said clutch mechanism to rotate said worm means (5), said one-way clutch mechanism comprising first bushing means (9) operatively connected to said linkage means and rotatably supported in said housing around said free end of said shaft means, second bushing means (12) operatively located

within said first bushing means, said first and second bushing means having respective inner and outer cooperating conical surface means, said second bushing means (12) and said free end of said shaft means comprising cooperating helical threaded means adapted to mesh for transmitting torque to said shaft means, whereby said worm means may be rotated in a stepless manner in the direction of adjustment.

4,071,121
AUTOMATIC ADJUSTMENT APPARATUS FOR A FRICTION BRAKE

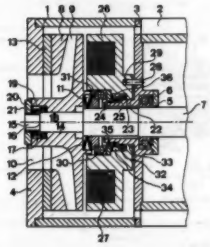
Peter Daniel, Pratteln, Switzerland, assignor to Inventio AG, Hergiswil, Switzerland

Filed Dec. 13, 1976, Ser. No. 750,253

Claims priority, applicstion Switzerland, Dec. 22, 1975, 16577/75

Int. Cl.² F16D 65/54

U.S. Cl. 188—196 P **5 Claims**



1. An automatic adjustment apparatus for a friction brake comprising at least two braking elements between which there is arranged a brake lining and which are adapted to be urged toward one another in a braking position, at least one of the braking elements being adjustably movable, comprising the combination of:

a substantially cylindrical portion having a

said cylindrical portion including a larger diameter part and a smaller diameter part;

substantially disc-shaped adjustment elements arranged to both sides of said shoulder on said larger and smaller diameter parts;

said disc-shaped adjustment elements being directly engageable with and displaceable by means of the adjustable braking element which is adjustably movable relative to the shoulder and the other braking element upon wear of the brake lining;

the adjustment element arranged directly at the shoulder upon the larger diameter part of the cylindrical portion being displaceable onto the smaller diameter part of the cylindrical portion upon wear of the brake lining;

the disc-shaped adjustment elements seated upon the larger diameter part of the cylindrical portion comprising shaft securing rings which are under constant radial stress during displacement along the larger diameter part and upon transfer to the smaller diameter part of the cylindrical portion lose their radial stress.

4,071,122
ADJUSTABLE SHOCK ABSORBER

Willard J. Schupner, Palatine, Ill., assignor to Efdyn Corporation, Chicago, Ill.

Continuation of Ser. No. 678,894, April 21, 1976. This application Mar. 14, 1977, Ser. No. 777,019

Int. Cl.² F16F 9/44

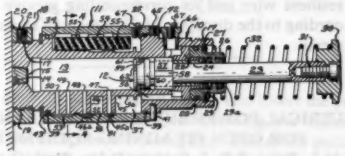
U.S. Cl. 188—285 **3 Claims**

1. In an adjustable energy absorber comprising a body member having a cylinder cavity therein formed about an axis, a piston movably mounted in said cylinder cavity, a reservior cavity and means providing an adjustable flow metering duct from the cylinder cavity to the reservoir cavity, the improvement comprising:

said body having an exterior face generally surrounding said cylinder cavity;

a sleeve surrounding said face and in annular contact with said body in two planes spaced along said axis and transverse thereto, said sleeve being rotatable with respect to the body about an axis generally parallel to said cylinder cavity axis and having an inner face, said inner face being spaced from said exterior face to define said reservoir cavity therebetween;

said means comprising a projection means extending radially through said reservoir cavity from one of said faces to contact the other of said faces with parts of said reservoir circumferentially at each side of said projection means,



said projection means being fixed in position with respect to the one face and having an opening therethrough in communication with one of said cavities, said other face being annular about said rotational axis and having a generally circumferential slot therein which is, at at least most positions of rotation of said sleeve, overlapping a part of said projection opening to permit fluid communication between the opening and the slot, said slot being in communication with the other of said cavities whereby communication is established between said cavities through said slot and projection opening and the overlap therebetween to form said duct, and means for varying the cross-sectional size of a part of the duct at said other face in response to the varied rotational position of the sleeve on the body.

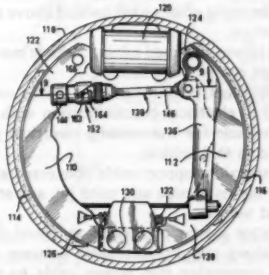
4,071,123
AUTOMATIC ADJUSTING DEVICE FOR A DRUM BRAKE

Pierre Courbot, Villiers le Bel, and Yves Meyer, Taverny, both of France, assignors to Societe Anonyme D.B.A., Paris, France

Filed Dec. 9, 1976, Ser. No. 748,999

Int. Cl.² F16D 51/52

U.S. Cl. 188—331 **7 Claims**



1. An automatic adjusting device for a drum brake having brake shoes adapted for engagement with a rotary drum by actuating means between adjacent ends of the brake shoes, said adjusting device comprising:

an extensible member for disposing said brake shoes relative

to said rotary drum, said extensible member including a pair of elements, extension of said extensible member being controlled by relative rotation between said elements; and

driving means interconnecting with a first shoe of said brake shoes and a first element of said pair of elements to control rotation of said first element upon actuation of the actuating means, the second element of said pair of elements being nonrotatably connected to a second shoe of said brake shoes, the first element having a pair of grooves;

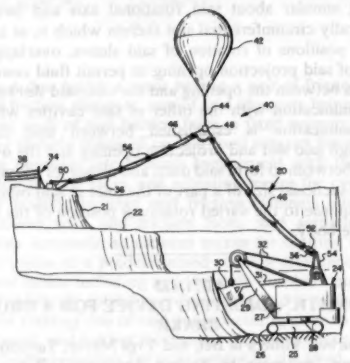
said driving means including a cam forming means movable in response to movement of said first shoe and repair of resilient wires engaging said cam forming means, each said wire frictionally engaging a respective groove on the first element to rotate the latter when said cam forming means moves, the frictional engagement between each resilient wire and its corresponding groove varying according to the direction of movement of said cam forming means.

4,071,124

ELECTRICAL POWER SUPPLY METHOD AND SYSTEM FOR OPEN PIT MINING EQUIPMENT

Donald L. Price, B.B. 2, Century Drive, Bend, Oreg. 97701

Filed Aug. 26, 1976, Ser. No. 718,044
Int. Cl.² H02G *11/00*
U.S. Cl. 191—12 R **9 Claims**



1. An electrical power supply system for supplying electrical power to electric motor-operated mining vehicles working on the floor of an open pit mine provided with haul roads on said floor and along terraced walls of said mine, said system comprising:

a source of electrical power sited on land above and adjacent to the mine pit,

an electrical power-operated mining vehicle movable within the mine pit on the floor thereof,

a flexible electrical power extension cable extending between and in electrical communication with said source and said vehicle for transmitting electrical power from said source to said vehicle,

a flexible suspension support cable connected at one end to an anchor means outside said mine pit, and at an opposite end to said vehicle,

cable connector means positioned at plural fixed spaced intervals along said support cable between its opposite ends and connecting said power cable to said support cable,

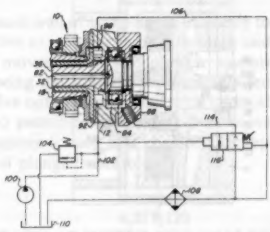
and lighter-than-air balloon suspension means connected to said support cable so as to elevate said cables above the floor of said pit and above said haul roads while said power cable remains connected to said source and said vehicle so as to enable said vehicle and other vehicles to move within said pit and along said roads without being obstructed by or traveling over said cable, thereby obviating the need to move or avoid said cable.

4,071,125

POWER TRANSMISSION WITH TORQUE CONVERTER LOCKUP CLUTCH

James J. Jameson, Coffeyville, Kans., assignor to Gardner-Denver Company, Dallas, Tex.

Filed July 21, 1976, Ser. No. 707,475
Int. Cl.² F16D *33/00, 35/00, 37/00*
U.S. Cl. 192—3.3 **2 Claims**



1. A transmission mechanism comprising: a hydrokinetic torque converter including a rotatable housing defining an interior space;

an input drive member connected to said housing;

fluid impeller means disposed in said interior space;

a turbine member disposed in said interior space and drivingly connected to an output shaft;

a torque converter lockup clutch including driving and driven members operable to be engaged to form a positive mechanical driving connection between said housing and said output shaft;

a piston disposed in said housing and dividing said interior spaced into first and second fluid chambers; said piston being responsive to fluid pressure forces acting thereon for effecting the engagement of said lockup clutch;

said impeller means and said turbine member being disposed in said first chamber;

restricted passage means interconnecting said first and second chambers for conducting torque converter working fluid from said first chamber to said second chamber;

a fluid circuit including means for conducting torque converter working fluid to said first chamber, means for conducting said fluid from said second chamber, and means for conducting fluid from said first chamber without passing through said second chamber; and,

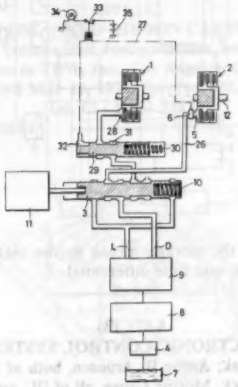
a control valve adapted to be in a first condition to provide for relatively free flow of fluid out of said second chamber so that the fluid pressure in said first chamber acts on said piston to effect the engagement of said clutch to provide said driving connection between said housing and said output shaft, said control valve is adapted to be in a second condition to substantially block the flow of fluid out of said second chamber whereby the fluid pressure difference between said first and second chambers is minimized, and

said control valve includes means responsive to a pressure rise of fluid flowing to said first chamber to cause said control valve to be in said first condition.

4,071,126
SAFETY APPARATUS IN AN AUTOMATIC TRANSMISSION FOR A VEHICLE TO PREVENT ENGAGEMENT OF THE LOW SPEED CLUTCH AT HIGH SPEEDS

Torao Hattori, 1-13-28, Shiraka, Wako, Saitama, and Masakazu Maezono, 1480, Owada, Niiza, Saitama, both of Japan

Division of Ser. No. 536,309, Dec. 24, 1974, abandoned. This application Mar. 11, 1976, Ser. No. 666,155
Int. Cl.[2] F16D *25/10, 43/284*
U.S. Cl. 192—87.12 **4 Claims**



1. In an automatic transmission apparatus for a vehicle of the type having a high speed clutch of an oil pressure operated type interposed in a high speed power transmission system and a low speed clutch of an oil pressure operated type interposed in a low speed power transmission system, a shift valve, the clutches being selectively connected through said shift valve to an oil pressure source, said low speed clutch being provided with an oil pressure chamber connectible to the pressure source, a safety apparatus comprising an automatic control valve coupled to said low speed clutch having a valve chamber in communication with said oil pressure chamber, said valve chamber having an outlet for relieving pressure in said oil pressure chamber, and a speed responsive valve member in said valve chamber for selectively opening said outlet thereof when the speed of rotation of the low speed clutch reaches a predetermined value; and said high speed clutch having a pressure chamber, said apparatus further comprising means connected to said outlet and to said pressure chamber of the high speed clutch for supplying pressure fluid fed to the low speed clutch to said high speed clutch when said automatic control valve is open.

4,071,127
METHOD OF WORKING FOR BENDING METAL MATERIAL AND THEREBY OBTAINED FRICTION CORE PLATE OF FRICTION CLUTCH

Hiroichi Suzuki, 1232 Kakezuka, Ryuyo, Iwata, Shizuoka, Japan

Filed Feb. 4, 1976, Ser. No. 655,191
Claims priority, application Japan, Feb. 6, 1975, 50-14876
Int. Cl.[2] B21D *53/26*
U.S. Cl. 192—107 R **3 Claims**

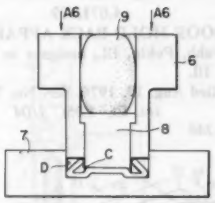
1. The method of working for metal bending comprising providing a press consisting of a lower die having a bottom wall and therefrom a perpendicular rising side wall and an upper die in slide contact with said side wall and a movable guide having a side wall in slide contact with another side wall of said upper die;

bending with another press a metal material piece folding it into an acute angle so that the length of the folded portion is larger than the distance between the side wall of said lower die and the side wall of said movable guide;

placing the folded piece upon the lower die bottom wall;

placing the folded portion between the side wall of the lower die and the side wall of said movable guide;

pressing said folded portion in a direction perpendicular to said bottom wall at the same time slide contacting said

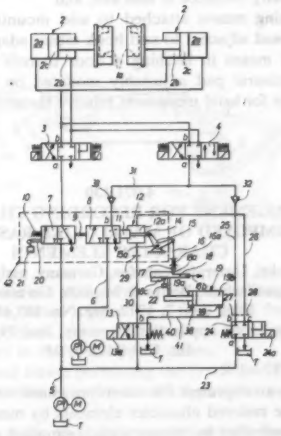


upper die both with the side wall of said lower die and the side wall of said movable guide buckling the folded portion in the direction of its length so that at the outside of the folded line of said folded portion a flat portion is formed which is perpendicular both to said folded portion and of said folded piece, with said folded portion bearing against and parallel to the folded piece.

4,071,128
APPARATUS FOR SHIELDING MOVING PARTS IN FLUID-OPERATED MACHINES

Walter Schmeisser, and Johann Talasz, both of Heidenheim, Germany, assignors to J. M. Voith GmbH, Heidenheim, Germany

Filed Oct. 22, 1976, Ser. No. 735,085
Claims priority, application Germany, Nov. 8, 1975, 2550204
Int. Cl.[2] F16P *3/08*
U.S. Cl. 192—133 **16 Claims**



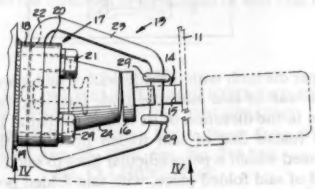
1. Apparatus for shielding the moving parts of machines wherein the moving parts receive motion from at least one fluid-operated motor which is connected with a source of fluid by at least one conduit, comprising a shield which is movable to and from an operative position; means for locking said shield in said operative position, including a blocking member movable to and from an arresting position in which said locking means maintains said shield in said operative position; a valve installed in said conduit and having a valve element movable between first and second positions in which said valve respec-

tively seals said source from said motor and allows fluid to flow therethrough; and means for mechanically coupling said valve element with said blocking member so as to move said valve element to said first position in response to movement of said blocking member from said arresting position.

4,071,129
DOOR HOLD-BACK APPARATUS

Elmer Ray Crabb, Pekin, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 19, 1976, Ser. No. 715,947
Int. Cl.[2] E05C 3/04
U.S. Cl. 292—246 **16 Claims**



1. A door hold-back apparatus comprising

a mounting means adapted for attachment to a panel of a vehicle comprising a block member adapted for securance to a panel of a vehicle, a plate mounted on an outboard side of said block member and fastening means releasably attaching said plate to said block member,

hook means pivotally mounted on said mounting means for swinging movements between latched and unlatched positions thereon, and

means defining an elongated slot between said block member and said mounting plate, said hook means disposed in and pivotally mounted in said slot, and

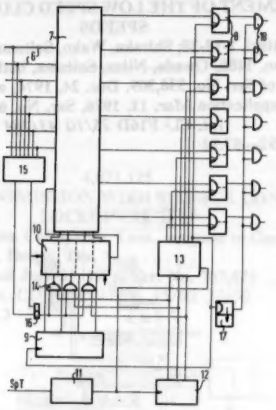
cushioning means attached to said mounting means and disposed adjacent to said hook means adapted to aid said hook means in latching a door thereto comprising an elastomeric pad adjustably mounted on said mounting means for axial movement relative thereto.

4,071,130
ARRANGEMENT FOR RECORDING CHARACTERS COMPOSED OF MATRIX-LIKE RASTERED CHARACTER ELEMENTS

Reiner Lichti, Unterpfaffenhofen, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jan. 7, 1977, Ser. No. 757,656
Claims priority, application Germany, Jan. 29, 1976, 2603347
Int. Cl.[2] B41J 3/04
U.S. Cl. 197—1 R **5 Claims**

1. In an arrangement for recording characters composed of matrix-like rastered character elements by means of a matrix printer controlled by binary signals supplied column-wise in parallel thereto from a character generator, to normally produce recorded characters having the portions thereof, extending transverse to the direction of the recording line, disposed at a predetermined angle relative thereto, in which such angle may be selectively changed, without change in the disposition of the matrix printer, to provide recorded characters having an appearance different from normal recorded characters, the combination of storage means to which the respective binary signals from the character generator are supplied in parallel, interrogation means connected to said character generator and to the storage means for effecting a time differential between the supply of respective character elements of a column to said storage means, and means for effecting the parallel release of

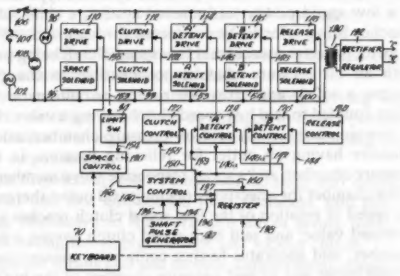


the contents of the storage means to the matrix printer in synchronism with said time differential.

4,071,131
ELECTRONIC CONTROL SYSTEM

Clarence W. Turek; Aaron B. Aronson, both of Glenview, and Dale C. Wittlock, Morton Grove, all of Ill., assignors to Signode Corporation, Glenview, Ill.

Filed Nov. 13, 1975, Ser. No. 631,690
Int. Cl.[2] B41J 7/96
U.S. Cl. 197—6.4 **19 Claims**



8. An electronic control system for a marking machine of the type having:

a marking member carrying a plurality of marking symbols,

means for driving said marking member to sequentially move said symbols past a marking location,

manually actuatable and deactuatable means for selecting one of said symbols, and

means for momentarily displacing said marking member into engagement with a workpiece to effect marking thereof with said selected one of said symbols at said marking location;

said control system comprising:

means for generating a plurality of pulses in response to movement of said marking member and in synchronism with the movement of said symbols past said marking location;

means responsive to said plurality of pulses for producing a plurality of outputs corresponding to said symbols;

means responsive to actuation of said symbol selecting means for selecting one of said outputs corresponding to said selected symbol;

means responsive to said selected output for effecting energi-

zation of said marking member displacing means to effect said momentary displacement of said marking member;

said pulse generating means generating said plurality of pulses as a sequential pulse train of individual encoded pulses; and

said pulse responsive means being responsive to each individual pulse of said pulse train for sequentially producing a different one of said outputs, each of which corresponds to that one of the symbols located at the marking location;

whereby the workpiece is marked by the selected one of said symbols located at said marking location.

4,071,132

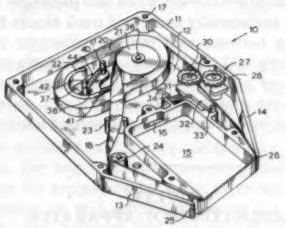
ENDLESS INKED RIBBON CARTRIDGE

James Marion Steinke, and Justin Gaskins, both of Longwood, Fla., assignors to TRW, Inc., Los Angeles, Calif.

Filed May 10, 1976, Ser. No. 684,770

Int. Cl.[2] B41J *33/10*

U.S. Cl. 197—168 **6 Claims**



1. An endless printer ribbon cartridge, comprising in combination:

a housing;

a roller rotably attached to said housing;

a slidably mounted ribbon holding member, having an arcuate ribbon wrapping portion and a base portion fixedly attached thereto;

guide means coupling said slidably mounted ribbon holding member to said housing for guiding said ribbon holding member in a predetermined path, said guide means having a slot in said slidably mounted ribbon holding member and a post attached to said cartridge housing and passing through said slot in said holding member;

an endless inked ribbon partially wrapped around said roller a plurality of turns and slidably mounted ribbon holding member for a plurality of turns to form a space therebetween, said ribbon having a predetermined path coming off the wrapped portion between said roller and said ribbon holding member and being fed through a predetermined path and back onto said partially wrapped portion of said ribbon; and

biasing means for biasing said slidably mounted ribbon holding means against said partially wrapped portion of said ribbon, said biasing means having a spring attached to said slidably mounted ribbon holding member and to said post passing through said slot in said ribbon holding member, whereby said endless ribbon cartridge compensates for variations in ribbon length.

4,071,133

CASSETTE FOR DYE IMPREGNATED RIBBON

Herbert Scherrer, Pfaffikon; Ernst Bopp, and Ennio Cecchetto, both of Zurich, all of Switzerland, assignors to Franz Buttner AG., Zurich, Switzerland

Filed Mar. 31, 1976, Ser. No. 672,127

Claims priority, application Germany, Nov. 8, 1975, 2551677

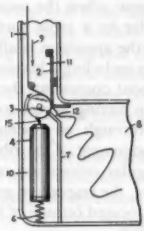
Int. Cl.[2] B41J *33/10*

U.S. Cl. 197—168 **1 Claim**

1. A cassette, for use in connection with a device for printing characters on a surface from the stroke impact of a central portion of an endless dye impregnated ribbon such as a typewriter, said device defining a stroke region,

comprising, in combination:

a housing defining two chambers, one of said chambers providing a storage region, said housing having a passageway for said ribbon, said passageway intercommunicating with said storage region and communicating with said stroke region, said ribbon being movable between said stroke region and said storage region;



re-impregnating means disposed in the other chamber and comprising a forked member and being operable for re-impregnating said ribbon with dye by impregnating portions of said ribbon adjacent to said central portion; and

transport means disposed substantially between said chambers and said passageway and operable for transporting said ribbon and for maintaining said ribbon substantially stretched in said stroke region.

4,071,134

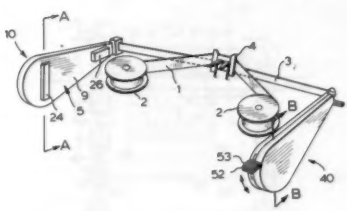
TYPING ERROR CORRECTION DEVICE

Frederick Harold Humphrey, 7 Orchard St., Markham, Ontario, Canada (L3P 2S9)

Filed Feb. 24, 1976, Ser. No. 660,835

Int. Cl.[2] B41J *29/36*

U.S. Cl. 197—181 **5 Claims**



1. Apparatus for use with a typewriter, comprising:

a first support means supporting a first spool for holding correction ribbon, the spool being mounted for rotation with respect to the first support means,

first attachment means permitting the first support means to be affixed to the outer cover of a typewriter at one side thereof,

a first ribbon guide pivotally mounted on said first support means, and having a first guide edge around which the ribbon can bend, whereby the orientation of said first guide edge can be manually determined, the first ribbon guide having visible alignment means to allow the user to know when the first guide edge is oriented perpendicular to a table surface supporting a typewriter to which the apparatus is affixed,

a second support means supporting a second spool for receiving correction ribbon, the second spool being mounted for rotation with respect to the second support means,

an indexing member adapted positively to rotate the second spool by increments,

second attachment means permitting the second support means to be affixed to the outer cover of a typewriter at the other side thereof,

and a second ribbon guide pivotally mounted on said second support means, and having a second guide edge around which the ribbon can bend, whereby the orientation of said second guide edge can be manually determined, the second ribbon guide having visible alignment means to allow the user to know when the second guide edge is oriented perpendicular to a table surface supporting a typewriter to which the apparatus is affixed,

each said support means including a housing which defines a protective compartment containing the respective spool, the correction ribbon having access to and egress from each compartment through an opening configured to allow unrestricted movement of the ribbon therethrough regardless of the angular orientation of the ribbon with respect to the housing, the respective guide edge for each support means being located outside of but adjacent to the respective said opening;

each said visible alignment means being constituted by an alignment finger extending perpendicular to the respective guide edge, whereby the alignment finger when oriented parallel to a table surface ensures that its respective guide edge is perpendicular to the table surface;

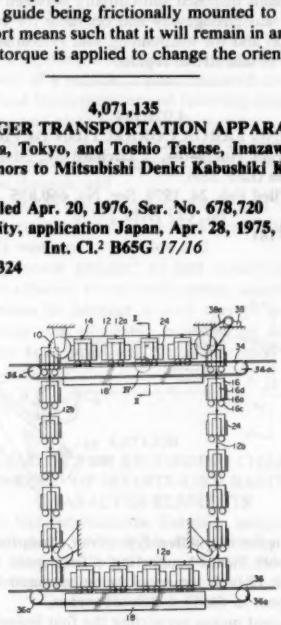
each ribbon guide being frictionally mounted to its respective support means such that it will remain in any orientation until torque is applied to change the orientation.

4,071,135

PASSENGER TRANSPORTATION APPARATUS

Riichi Ishikawa, Tokyo, and Toshio Takase, Inazawa, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 20, 1976, Ser. No. 678,720
Claims priority, application Japan, Apr. 28, 1975, 50-51806
Int. Cl.[2] B65G *17/16*
U.S. Cl. 198—324 **5 Claims**



1. An apparatus for transporting passengers between two vertically spaced positions, said apparatus comprising

first and second horizontal track blocks vertically spaced from each other;

a plurality of passenger car means rollable along said first and second track blocks for transporting passengers therein, said passenger car means having at least one open side;

continuous drive chain means connected to said passenger car means and positioned horizontally above and vertically between both of said horizontal track blocks, said chain means being substantially rectangular in overall configuration, for moving said passenger car means connected thereto horizontally along and vertically between said first and second horizontal track blocks;

motor means operatively connected to said chain drive means for continuously driving said chain drive means and said passenger car means connected thereto;

first horizontal moving platform means adjacent and parallel to said first track block on the same side as said opening into said passenger car means on said first track block and movable in the same direction and at the same speed as said passenger car means on said track block for carrying passengers to and from said passenger car means;

second horizontal moving platform means adjacent and parallel to said second track block on the same side as said opening into said passenger car means on said second track block and movable in the same direction and at the same speed as said passenger car means for carrying passengers to and from said passenger car means on said second track block; and

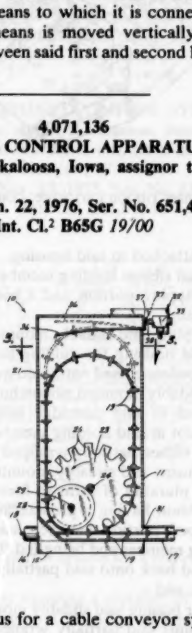
rotatable side guard plate means connected to each of said passenger car means and rotatable toward the passenger car means adjacent thereto when said passenger car means are moved horizontally along said track blocks for closing the spacing between said moving passenger car means moving along said track blocks and rotatable toward the passenger car means to which it is connected when said passenger car means is moved vertically on said chain drive means between said first and second horizontal track blocks.

4,071,136

CABLE CONTROL APPARATUS

Robert D. Jones, Oskaloosa, Iowa, assignor to Intraco, Inc., Oskaloosa, Iowa

Filed Jan. 22, 1976, Ser. No. 651,450
Int. Cl.[2] B65G *19/00*
U.S. Cl. 198—735 **16 Claims**



1. A drive apparatus for a cable conveyor system comprising:

a housing;

drive wheel means rotatably attached to said housing;

a continuous cable having a plurality of spaced members rigidly attached thereto, a portion of said cable being disposed around one side of said drive wheel means, said drive wheel means engaging said cable for pulling said cable through said cable conveyor system, said one side of the drive wheel means being defined as the portion of said drive means having said cable in contact therewith at all times; and

channel means attached to said housing for receiving and guiding a partial loop of excess cable and for allowing movement of said partial loop due to a change in size of said partial loop from a point in which an intermediate part of said partial loop is in contact with the other side of said drive wheel means to a point in which said intermediate part is spaced a substantial distance from said drive

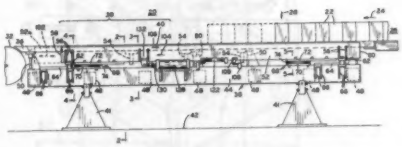
wheel means whereby said channel means comprises the sole support for said partial loop, said partial loop of excess cable extending from the point at which said cable departs contact with said drive wheel means to a point at which said cable departs said channel means.

4,071,137

WALKING BEAM CONVEYOR APPARATUS AND METHOD OF OPERATING THE SAME

Richard A. Fink, Auburn, Ind., assignor to Auburn Foundry, Inc., Auburn, Ind.

Filed Dec. 13, 1976, Ser. No. 750,116
Int. Cl.[2] B65G *25/04*
U.S. Cl. 198—774 **24 Claims**



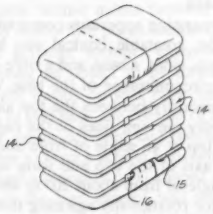
1. In walking beam-type conveyor apparatus having at least one elongated, stationary member, means for supporting said stationary member, and at least one elongated, longitudinally movable member adjacent and parallel with said stationary member, said members having upper surfaces for supporting a load thereon, the improvement comprising: inflatable fluid bearing means for supporting by a film of escaping fluid said movable member on said supporting means for longitudinal movement thereon between first and second positions; first means for supplying fluid under a first predetermined pressure to said bearing means during movement of said movable member in one direction from said first to said second position thereof, said first pressure being such that said movable member applies sufficient force to the load thereon that said load and movable member are moved in unison in said one direction; second means for supplying fluid under a second predetermined pressure to said fluid bearing means during movement of said movable member in the opposite direction from said second to said first position thereof, said second pressure being lower than said first pressure and being such that said load remains supported on said stationary member at the position to which it was previously moved while said movable member is moved in said opposite direction; and means for longitudinally moving said movable member at least in said opposite direction from said second to said first position thereof.

4,071,138

COTTON BALE COVER

Herbert J. Wright, Rte. 4, Box 233, Piedmont, S.C. 29673

Filed May 29, 1975, Ser. No. 581,726
Int. Cl.[2] B65D *71/00*
U.S. Cl. 206—83.5 **7 Claims**



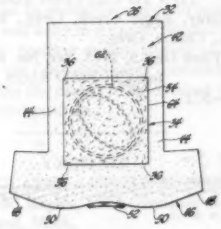
1. A covered bale comprising:
a predetermined mass of cotton fibers contained and confined in compression in the form of a bale for transport to a textile mill,
a cover enshrouding the mass of fibers,
spaced tensioned strapping passing about said cover,
said cover formed from a fabric knitted from yarn consisting essentially of cotton fibers,
said yarn forming said knitted fabric being spun on open end spinning apparatus and possessing a coarse yarn count of from about 3 to 10 providing air permeability for aiding in avoiding mildew of said cotton fibers within said bale,
said fabric being warp knit from said yarn in a fabric construction including chain stitches in the length direction and cross lapping yarn tying said chain stitches together in a direction transverse to the chain stitches; and
said fabric construction of course cotton yarn being porous and air permeable to avoid mildew of said mass of cotton fibers within said bale,
said fabric being stretchable and stable in the direction of the chain stitch and in the direction of the cross lapping yarn to aid in maintaining compression of said bale, and
said cotton fibers of the cover engaging the mass of cotton fibers being compatible therewith avoiding contamination thereof.

4,071,139

PACKAGED SHIRT WITH RECORD ALBUM STIFFENER

Vincent S. Pernicano, Boyne Falls, and Michael R. Wright, Detroit, both of Mich., assignors to Art-On Designs, Inc., Ferndale, Mich.

Filed Feb. 27, 1976, Ser. No. 661,936
Int. Cl.[2] B65D *85/18, 85/30*
U.S. Cl. 206—216 **3 Claims**



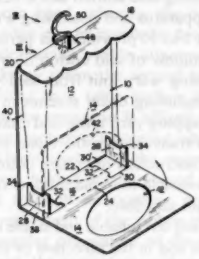
1. A packaged shirt assembly comprising: stiffener means having at least three interconnected stiff corners spaced apart from each other, said corners defining a display area, a shirt, a design disposed on said shirt, said shirt being disposed about said corners in a predetermined position with said shirt folded around the outer periphery of said display area and said design displayed over said display area, and securing means for securing said shirt about said stiffener means in said predetermined position, said shirt including front and back portions which coact to define an interior body cavity, said stiffening means being disposed exteriorly of said body cavity and said design being exteriorly of and on said front portion, said front and back portions including central sections covering said display area, said design being disposed on said central section of said front portion, said stiffener means including front and back surfaces extending between peripheral edges with said central sections extending over said front surfact, said stiffener means being defined by a record album assembly including a record album container and a record disposed within said container.

4,071,140

PACKAGE AND DISPLAY DEVICE

Richard G. Rattner, 137 Palmyra Ave., Woodmere, N.Y. 11598

Filed Feb. 23, 1977, Ser. No. 771,280
Int. Cl.² B65D *85/18*
U.S. Cl. 206—295 **3 Claims**



1. A display package for folded soft goods comprising a planar back portion, a folded up front portion, a bottom portion separating front and back portions and forming a space for the reception of the folded goods, a roof portion folded down from the other end of the back portion, fold lines along either side of the bottom portion, short score lines overlying part of said fold lines, a pair of U-shaped transverse cuts joining said score lines, said score lines and transverse cuts forming side flaps folded up from the bottom portion and to act as distance pieces between said front and back portions and impart rigidity to the package, the arrangement being such that the spaces, from which the side flaps are cut out, form windows in the bottom portion so that the contents of the package become visible and the side flaps act as lateral supports for the folded goods resting on the bottom portion.

4,071,141

METHOD AND PRODUCT FOR ATTACHING CUTTING TIPS TO CUTTING TOOLS

Gorman D. Gray, Eagle Creek, Oreg., assignor to Lifetime Carbide Co., Colton, Oreg.

Filed Dec. 5, 1975, Ser. No. 637,841
Int. Cl.² B65D *85/28*
U.S. Cl. 206—372 **6 Claims**

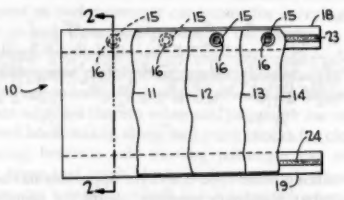
1. A cutting tip stick comprising: a plurality of individual elongate cutting tips pre-formed for separate attachment to the teeth of a cutting blade; each said elongate cutting tip having respective first and second longitudinally opposite ends, means defining a pre-formed contact surface extending along the majority of the length thereof for mating with a tooth of a cutting blade, and a pre-formed cutting edge separate from said contact surface formed at said first end thereof; said cutting tips being attached to one another by adhesive means in an adjoining series forming an elongate strip of said tips, said adhesive means being attached to the contact surface of each said cutting tip in an amount on each contact surface effective for bonding said contact surface operatively to a tooth of a cutting blade, said respective first end of each said tip being positioned adjacent the second end of a next adjoining one of said tips in said series in substantially end-to-end relation such that said majority of the length of each tip is free of abutment with any adjoining tips in said series, so as to permit each said respective contact surface along the length of a tip to be placed in operative attaching position against a respective tooth of a cutting blade while said tip remains attached to a next adjoining tip in said series.

4,071,142

STUBLESS MULTI-PART ASSEMBLY

Emil A. D'Luhy, Youngstown, N.Y., assignor to Moore Business Forms, Inc., Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 623,393, Oct. 17, 1975, Pat. No. 4,039,046. This application July 23, 1976, Ser. No. 708,176
The portion of the term of this patent subsequent to Aug. 2, 1994, has been disclaimed.
Int. Cl.² B65D *27/34*
U.S. Cl. 206—629 **6 Claims**



1. A multi-part mailer construction, comprising, superimposed first, second, third and fourth parts, said third part having at least one first hole therein of a predetermined first size along one of its margins, a quantity of detachable adhesive extending between said second and fourth parts and through said hole of said third part for securing said second and fourth parts together, said adhesive extending through said first hole having a cross-sectional size which is less than said predetermined size of said first hole so as to be spaced inwardly of the marginal edge of said first hole for retaining said third part in place, said first part having glue flaps on opposing sides thereof underlying said fourth part and being secured thereto whereby said first, second and fourth parts are connected together with said third part being immobilized to form a mailer construction having open sides at other than said opposing sides, one of said flaps having said adhesive thereon, said flaps being removably secured to said first part along opposed lines of weakening, and said parts each being devoid of any tear lines which may form a stub, whereby removal of said first part leaves said second, third and fourth parts intact, or separation of said second and fourth parts effects a break of said adhesive and frees said third part from the remaining of said parts while leaving said first and fourth parts interconnected, or removal of said first part together with separation of said second and fourth parts separates each of said parts from one another.

4,071,143

ORE SEPARATING METHOD AND APPARATUS

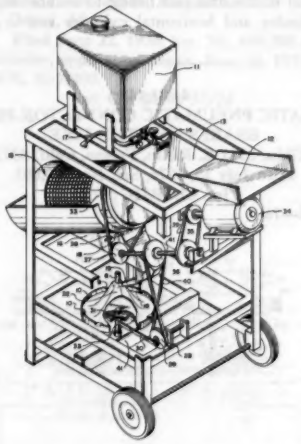
Max R. Richan, 545 N. 3rd East, Brigham City, Utah 84302

Filed Dec. 2, 1976, Ser. No. 746,955
Int. Cl.² B03B *5/74*
U.S. Cl. 209—444 **25 Claims**

1. An ore-separating apparatus comprising:
   a. an upright, rotatable conical cap having a truncated, rounded top, sides, a base, and a riffle extending vertically from the circumference of the base, the sides of the cap curving inwardly between the top and the base wherein the inwardly curving sides of the cap extend downward from the top at an angle of from about 30° to about 45° from the axis of the cap and form an arc having a subtended angle of from about 20° to about 30°;
   b. a means for rotationally agitating the cap; and
   c. a means for evenly introducing a uniform slurry of ore to the rounded top of the cap at a low velocity;

so that the slurry gravitationally and evenly flows down the sides of the agitating cap and changes flow direction with the

inward curvature of the sides, whereby such change in direction contrifugally separates heavier precious metals in the



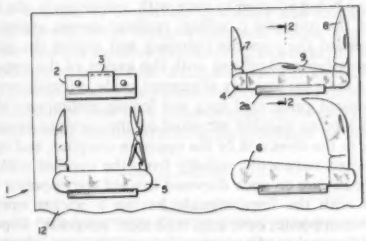
slurry from lighter ore tailings with the result that the heavier metals are captured by the riffle and the lighter tailings are carried over the riffle and away.

4,071,144

DISPLAY FOR KNIVES

George Krubski, Jersey City, N.J., assignor to Cooper Industries, Inc., Houston, Tex.

Filed July 15, 1976, Ser. No. 705,394
Int. Cl.² A47F 7/00
U.S. Cl. 211—13 **5 Claims**



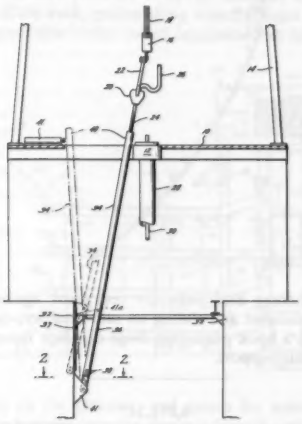
1. A display panel which comprises a base, a plurality of elongated rigid plastic holder means fastened to a surface of the base, each rigid non-brittle plastic holder means having a back member and a flange member extending transversely thereto for supporting an object to be displayed, a pair of spaced apart fastener means on said back member fastening each holder means to said base, the portion of each back member of each holder means between said fastener means being spaced from the base to form a pocket between the back member and the base, and a plurality of U-shaped clip means proportioned such that the legs thereof will straddle the back member of a holder means when one leg is inserted in a pocket of a holder means, the object to be displayed being secured to the holder means by engagement with the other leg of said clip means.

4,071,145

PIVOTAL AND RELEASABLE RAT HOLE ASSEMBLY

David C. Guinn; Archie K. Haggard, and John P. Thomas, all of P.O. Box 1126, Houston, Tex. 77001

Filed Oct. 4, 1976, Ser. No. 729,495
Int. Cl.² A47F 7/00
U.S. Cl. 211—60 S **11 Claims**



1. A rat hole assembly for storing a kelly used in the drilling of a well comprising,

an elongate casing of a size sufficient to receive and support the kelly during storing,

the elongate casing being perforated adjacent its lower end to permit passage of fluid on inserting and withdrawing the kelly into or from the casing, and

a releasable pivot connection and anchor assembly for connection to a structural support member pivotally and releasably connecting the lower end of the casing to the structural support member arranged so that the upper end of the casing can be pivotally moved to receive the kelly, and the casing and kelly in it can be pivotally moved to an out of the way position during storing of the kelly and when not in use, the releasable connection including means permitting the casing to be released only in the out of the way stored position.

4,071,146

ARTICULATED ARTICLE SUPPORT

John H. Batts, Grand Rapids, Mich., assignor to John Thomas Batts, Inc., Zeeland, Mich.

Filed Jan. 2, 1976, Ser. No. 646,178
Int. Cl.² A47F 7/19
U.S. Cl. 211—87 **33 Claims**

1. An articulated article support for hook suspended article display devices, comprising:

an elongaed, flexible tension load supporting member;

a plurality of links slidably mounted end to end on said load supporting member, each of said links including an outwardly projecting hook and ends rounded in a fore and aft direction to permit said links to articulate about each other and to prevent the application of a severe tension load to said load supporting member when the lower end thereof is pulled outwardly; and

means attached to said load supporting member for securing one end of said member to a support surface.

27. An articulated article support comprising an elongated flexible tension member of rectangular cross section having a width substantially greater than its thickness and a plurality of elongated links slidably arranged in tandem end to end relationship along said member; said links each having a lengthwise extending passage through which said member extends;

said passage having a transverse cross-sectional shape to seat closely about said member and a lengthwise cross-sectional shape to cause said member to trace a nonlinear path and increase the frictional force between said links and said tension

member whereby said links are restrained against rotation about said member and sliding on said member; each of said links having a hook projecting from one face thereof to provide an article support.

4,071,147

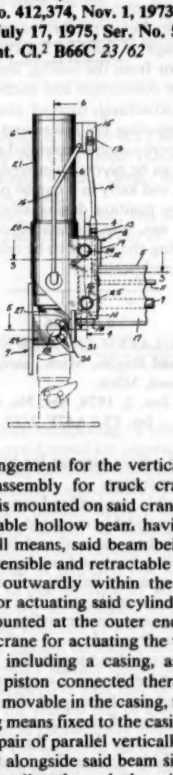
MOUNTING FOR AN OUTRIGGER CYLINDER ON A CRANE

John T. Hornagold, Waukesha, Wis., assignor to Bucyrus-Erie Company, South Milwaukee, Wis.

Continuation of Ser. No. 412,374, Nov. 1, 1973, abandoned. This application July 17, 1975, Ser. No. 596,827

Int. Cl.² B66C *23/62*

U.S. Cl. 212—145 **7 Claims**



1. A mounting arrangement for the vertical cylinder of an extensible outrigger assembly for truck cranes or the like wherein the outrigger is mounted on said crane and includes an extensible and retractable hollow beam having an outer end with opposite side wall means, said beam being connected to and actuated by an extensible and retractable horizontal cylinder rod that extends outwardly within the beam, a power source on said crane for actuating said cylinder rod, a vertical hydraulic cylinder mounted at the outer end of the beam, a power source on said crane for actuating the vertical cylinder, said vertical cylinder including a casing, an extensible and retractable rod and a piston connected thereto and wherein said rod and piston are movable in the casing, the improvement comprising a mounting means fixed to the casing of the vertical cylinder comprising a pair of parallel vertically disposed plates extending respectively alongside said beam side wall means, a first connector pin extending through the said plates and side wall means for securing the beam and vertical cylinder in assembled relationship, a fitting secured to the outer end of the horizontal cylinder rod, and a second connector pin spaced from said first connector pin extending through the said plates and side wall means and said fitting to secure the beam and vertical cylinder and horizontal cylinder rod in assembled relationship.

4,071,148

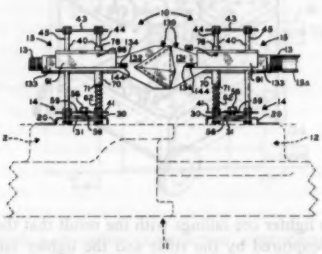
AUTOMATIC PNEUMATIC CONNECTOR FOR AIR BRAKES AND THE LIKE

Lilburn E. Tibbs, 3511 E. Rialto, Fresno, Calif. 93726

Filed July 23, 1976, Ser. No. 708,093

Int. Cl.² B61G *5/06*

U.S. Cl. 213—76 **10 Claims**

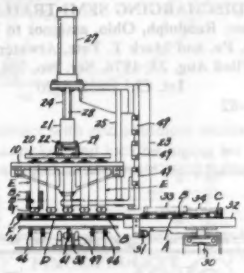


1. An automatic connector for air lines and the like having a pair of substantially identical oppositely facing pneumatic couplings each comprising a carriage assembly; a substantially cylindrical horizontal pneumatic conduit adapted to communicate with a pneumatic brake system slidably mounted on the carriage assembly for axial movement toward and from the opposite coupling having an opening directed toward the opposite coupling having an opening directed toward the opposite coupling, said conduit having a gasket mounted on the end of the conduit disposed toward the opposite coupling in circumscribing relation to the opening in the conduit, said cylindrical conduit having radially outwardly of the gasket a cylindrical pin and opposite cylindrical bore with respective axes substantially parallel to the conduit with the pin extending beyond the gasket toward the opposite coupling and with the pin and bore being adapted to mate with, respectively, the bore and pin of the opposite coupling; resilient means urging the conduit toward the opposite coupling and urging the gasket into compressive engagement with the gasket of the opposite coupling; a male preliminary alignment guide; a female preliminary alignment guide, said male and female preliminary alignment guides being slidably mounted on the carriage assembly projecting in the direction of the opposite coupling and oppositely disposed outwardly radially from the conduit with the male guide having an apex disposed toward the opposite coupling and with the female guide having a pocket opening toward the opposite coupling with the centrally disposed portion of the pocket adjacenet to the conduit being adapted to mate with the male guide of the opposite coupling and with the opposite portion of the pocket outwardly from the conduit having outwardly inclined planes adapted to direct the male guide of the opposite coupling into mating engagement with said inward portion of the pocket; resilient means urging the male and female preliminary alignment guides toward the opposite coupling; a mounting assembly having a post on which the carriage assembly is slidably mounted for vertical movement and having resilient means urging the carriage assembly toward an intermediate position on said post; a base plate on which the mounting assembly is slidably mounted for horizontal movement substantially perpendicularly to the axis of the conduit and pivotally mounted for movement about a substantially vertical axis; and resilient means urging each mounting assembly toward a predetermined rest position on its respective base plate.

4,071,149
APPARATUS FOR PILING APERTURED ARTICLES IN STACKS FOR STORAGE

Osamu Deguchi, Iwata, Japan, assignor to NTN Toyo Bearing Co. Ltd., Osaka, Japan

Filed June 22, 1976, Ser. No. 698,595
Claims priority, application Japan, June 24, 1975, 50-78953; June 24, 1975, 50-78955
Int. Cl.² B65G 57/24
U.S. Cl. 214—6 P 6 Claims



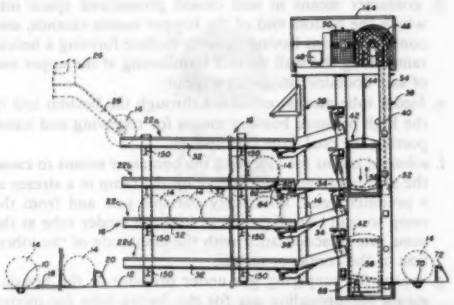
1. An apparatus for piling apertured annular articles in vertical stacks for storage comprising an elongated, horizontally disposed rail member, means associated with said rail member for conveying a predetermined number of annular articles thereon in longitudinally aligned and successively positioned relationship, a plurality of vertically disposed and vertically reciprocable holder means corresponding in number to the number of apertured articles on said rail member positioned above said rail member with each holder means being adapted to be in vertical alignment with the aperture of an annular article when positioned thereon, each of said holder means having outwardly projectable retaining means adjacent its lower end thereof, actuating means for moving said holding means downwardly and upwardly and to simultaneously move the retaining means inwardly and outwardly respectively whereby each holder means on its downward movement will have its lower end pass through the aperture of a corresponding annular article and on its upward movement the retaining means will be projected outwardly thereby permitting the annular member to be carried upwardly and retained on the holding means, table means positioned below and at right angles to said rail member for receiving a plurality of vertically stacked apertured annular articles thereon from each of said holding means, and drive means for moving said table means at a predetermined time for a distance equal to the outer diameter of an apertured annular article being processed by the apparatus.

4,071,150
CONDUCTOR SUPPLY SYSTEM FOR COMMUNICATION CABLE MAKING APPARATUS

Walter F. Thompson, and Dennis M. Redo, both of Somerville, N.J., assignors to General Cable Corporation, Greenwich, Conn.

Filed Oct. 28, 1975, Ser. No. 626,219
Int. Cl.² B65G 11/08
U.S. Cl. 214—16.4 R 17 Claims

1. A bobbin supply rack and selective dispensing system for a communication cable manufacturing facility in which wire is wound on bobbins having flanges on both sides thereof and on which the bobbins roll from one location to another, including in combination a rack having a plurality of compartments in vertical alignment with one another and similar horizontally-spaced compartments in horizontal alignment with one another, a supply of bobbins, each having a drum portion and flanges at opposite ends of the drum portion, groups of the bobbins having wire wrapped thereon with insulation of different color coding on the wire than on other groups of the bobbins, each of the compartments being of a length to receive and accumulate a plurality of bobbins wrapped with insulation of the same color coding, each compartment having a discharge end, an elevator shaftway at the end of the rack at which each of the discharge ends of the compartments are located, an elevator in the shaftway and extending across the discharge ends of a plurality of the horizontally spaced compartments of the rack, guides along which flanges of the bobbins of a particular color coded insulation roll into a prese-

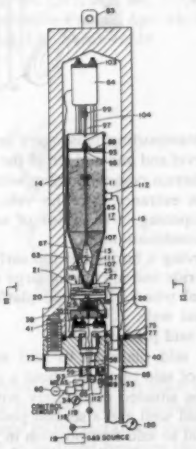


lected space on the elevator, and means for selectively discharging the bobbins onto the elevator from the selected horizontally spaced compartments in accordance with the color coded wires necessary for delivery to a cable making facility, said means for selectively discharging the bobbins including separate motor means at each compartment, and a stop operated by each of the separate motor means into a position to prevent discharge of a bobbin from the compartment of that motor means and into a position that permits the bobbin to roll from the compartment onto the elevator.

4,071,151
VIBRATORY HIGH PRESSURE COAL FEEDER HAVING A HELICAL RAMP

Gerald Farber, Elmont, N.Y., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 24, 1976, Ser. No. 744,474
Int. Cl.² C10J 3/30
U.S. Cl. 214—35 R 5 Claims



1. Apparatus for feeding coal at an accurately controlled

rate to a feeder tube adapted to be connected to a high pressure, heated, reactor tube, comprising:

a. hopper means having top and bottom ends for receiving and transporting said coal in a first direction along a longitudinally extending axis;

b. valve means for selectively closing the bottom end of said hopper means selectively to hold and selectively to release the coal along the axis for the flow of coal out the bottom of the hopper means past and around the valve means;

c. pressure-tight housing means for selectively enclosing the hopper means in a closed pressurized space;

d. container means in said closed pressurized space into which the bottom end of the hopper means extends, said container means having an inner surface forming a helical ramp along the wall thereof terminating at the upper end of said container means in a spout;

e. feeder tube means connected through the bottom end of the high pressure housing means for receiving and transporting the coal from said spout;

f. solenoid means for vibrating the container means to cause the coal continuously to move up the ramp in a stream at a predetermined, selectively variable rate and from the ramp to spill out of the spout into the feeder tube at the same rate in accordance with the amplitude of the vibration of the container means;

g. means for supplying gas under pressure to the housing means for providing gas for the feeder tube for mixing with the coal means received thereby from the spout; and

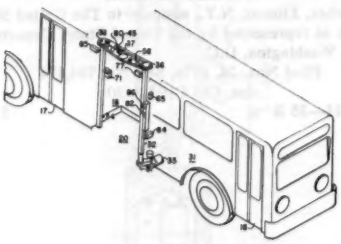
h. means for measuring the rate of coal flow through the hopper means.

4,071,152

WHEELCHAIR LIFT FOR PUBLIC TRANSPORTATION VEHICLE

Jordan A. Kinkead, Atherton; James T. Pott, Palo Alto; Roger M. Sherman, Los Gatos, and Eugene F. Sullivan, San Jose, all of Calif., assignors to County of Santa Clara, State of California, San Jose, Calif.

Filed Dec. 13, 1976, Ser. No. 750,205
Int. Cl.[2] B60P *1/44*
U.S. Cl. 214—75 R **17 Claims**



1. A lift for transporting passengers between ground level and passenger level and into and out of the vehicle, said vehicle having a well therein communicating with an opening in one wall to form an entrance into the vehicle, said well being defined by an opening in the floor of said vehicle, said lift comprising, in combination:

a platform having a horizontal top surface on which a passenger can ride and also being large enough to support a conventional wheel chair, said platform being of larger size than said well;

a support for said platform;

means fixing said platform to said support for pivoting movement of said platform about a pivot and between a first position situated completely within the vehicle and covering said well and a second position turned substantially normal to said first position in which said platform occupies the space in the well and extends through and beyond said wall opening of the vehicle;

first actuating means for rotating said platform between the first and second positions; and

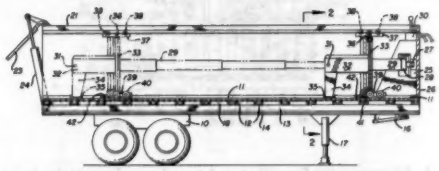
second actuating means for moving said support vertically between the passenger level and the ground level positions whereby the platform can be lowered below said floor when in said second position and raised above the floor and pivoted to said first position within the vehicle.

4,071,153

VERTICAL PUSHER PLATE FOR A HORIZONTALLY DISCHARGING SEMI-TRAILER

Howard Booher, Randolph, Ohio, assignor to Robert J. Bruce, New Castle, Pa. and Mark T. Tate, Atwater, Ohio

Filed Aug. 23, 1976, Ser. No. 716,988
Int. Cl.[2] B65F *3/20*
U.S. Cl. 214—82 **9 Claims**



1. A vertical pusher plate machanism for operation in a horizontally discharging semi-trailer having an elongated body with a floor and a discharge opening in one end, comprising:

a vertically oriented pusher plate slidably mounted in the trailer body for movement toward and away from the discharge opening;

a pusher plate moving means mounted to one side of said pusher plate on the trailer body, extending through said pusher plate and connected thereto on the other side of said pusher plate near the center of said pusher plate, said pusher plate moving means being oriented and connected to said pusher plate to apply horizontally directed force to said pusher plate near the center of said pusher plate;

a pusher plate supporting means which includes a first elongate portion connected at one end thereof to said pusher plate other side near the center of said pusher plate to extend horizontally and outwardly from said pusher plate and a second elongate portion connected at one end thereof to the other end of said first elongate portion, said second elongate portion extending downwardly from said first elongate portion and having the other end thereof slidably contacting the trailer body floor at a location between said pusher plate and the discharge opening so that forces acting on said pusher plate tending to tilt same as said plate moves toward the trailer discharge opening are transmitted to the trailer body via said pusher plate supporting means.

4,071,154

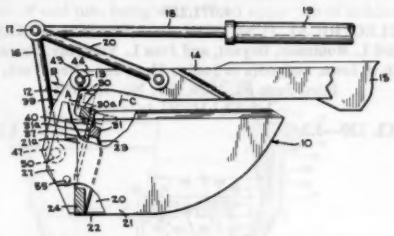
BRACKET CONNECTION FOR BACKHOE AND SKIP LOADER

Reynold R. Retzlaff, 552 Bean Creek Road No. 24, Scotts Valley, Calif. 95066

Filed Sept. 3, 1976, Ser. No. 720,260
Int. Cl.[2] E02F *3/70*
U.S. Cl. 214—145 A **7 Claims**

1. In a coupling mechanism for attaching an implement to the control arms of a backhoe or the like wherein a first coupling member is mounted on the control arms for engagement with a second coupling member carried by the implement, the improvement which comprises transversely extending spaced parallel bars carried by said second coupling member to define a socket and providing abutment means extending transversely across substantially the entire width of said implement, a transverse plate carried by said first coupling member and having an

upper end portion adapted to be inserted into said socket with its transverse faces engaging said bars in an abutting relation, transverse means on said first coupling member adapted for



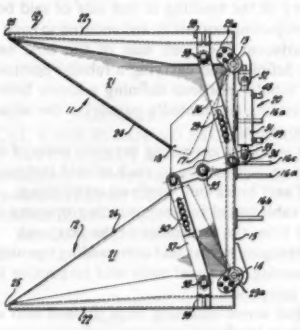
movement into contact with said abutment means as said plate is moved into said socket, and locking means for holding said coupling members together when said plate is disposed in said socket.

4,071,155

PINCER BUCKET

Samuel A. Hart, 720 Anderson Road, Davis, Calif. 95616, and William E. Hart, P.O. Box 1734, Fort Collins, Colo. 80522

Filed May 17, 1976, Ser. No. 687,360
Int. Cl.[2] B66C *3/02*
U.S. Cl. 214—147 G **5 Claims**



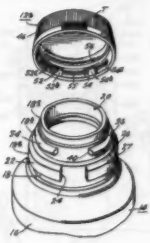
1. A pincer bucket comprising:
a. first and second pincer bucket halves mounted for relative pivotal movement about at least one vertical axis at the rear thereof;
b. generally planar upstanding side walls mounted on each of said pincer bucket halves, said side walls extending forwardly to define a generally rectilinear area therebetween when said halves are in open position and being movable to a position where their leading edges are in close juxtaposition when said halves are in closed position;
c. a substantially planar horizontal pincer blade of generally triangular configuration extending inwardly from each of said walls to form a partial bottom for said pincer bucket when said halves are in open position, said pincer blades moving into at least closely adjacent position when said halves are moved to closed position and therefore being adapted to undercut a pile of freestanding material on a substantially horizontal surface as said blades are closed with their bottom surfaces closely adjacent said horizontal surface;
d. means for opening and closing said pincer bucket halves; and
e. means for moving said pincer bucket forward in open position with said pincer blades disposed generally horizontally and closely above said horizontal surface; whereby major portions of said freestanding material are collected above the blades.

4,071,156

CHILD RESISTANT CONTAINER-CLOSURE ASSEMBLY

Allen D. Lowe, Montoursville, Pa., assignor to The West Company, Phoenixville, Pa.

Filed Aug. 13, 1976, Ser. No. 714,019
Int. Cl.[2] B65D *55/02, 85/56*
U.S. Cl. 215—224 **21 Claims**



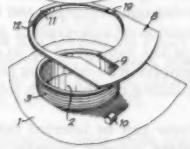
1. A closure for a container having a neck with an access opening therein and means defining a locking rib on the outer surface of the neck interrupted at least at two circumferentially spaced locations to define gaps therein of predetermined differing arcuate dimensions, said closure including a cap having a top, a skirt depending from the outer edge of the top and at least a pair of primary locking lugs projecting radially inwardly from the skirt which in all positions, except one, engage under said locking rib to secure the cap in place, said primary lugs being of an arcuate span and circumferential spacing to register with said gaps in said one position and at least one auxiliary releasable locking lug of a shallower radial projection than said primary lugs engaging under said bead when said cap is in said one position, said auxiliary lug operable to snap over said bead in said one position when said cap is tilted relative to the neck of the container.

4,071,157

SAFETY STOPPERING DEVICE

Ramon Apellaniz, Lasne-Chapelle-Saint-Lambert, Belgium, assignor to Euracom S.A., Brussels, Belgium

Filed Mar. 14, 1977, Ser. No. 777,444
Claims priority, application France, Apr. 14, 1976, 76 1106
Int. Cl.[2] B65D *41/34*
U.S. Cl. 215—252 **6 Claims**



1. Tamper-proof device for containers made of plastic materials provided with a threaded collar intended for fitting a screw cap, characterized by the fact that it comprises a rupturable platelet intended to be fitted between the container and the cap, around the collar, said platelet comprising at least one

locking tooth for the purpose of being engaged by at least one tooth borne for this purpose by aforesaid stopper.

4,071,158

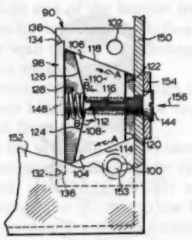
SCREW FASTENING DEVICE

Joseph S. Maheu, 10 Ruddington Drive, Apartment 10 North, Suite 307, Willowdale, Ontario, Canada

Continuation-in-part of Ser. No. 603,477, Aug. 11, 1975, abandoned. This application Mar. 12, 1976, Ser. No. 666,518

Int. Cl.[2] H02G *3/08*

U.S. Cl. 220—3.2 **5 Claims**



1. An electrical box fitted with at least one screw fastening device to receive a screw for coupling an electrical component to the box, the device comprising:

a support;

fastening means attaching said support to a flat surface portion of said electrical box;

said support including: a base having a flat inner surface; two spaced side walls coupled to said electrical box and supporting said base with its said flat inner surface in spaced parallel relationship to that flat surface portion of the box, said side walls of the support defining two convergent flat inner wall surfaces disposed in opposed positions in planes normal to said flat inner surface of the base and to said flat surface portion of the electrical box; and an end wall extending between said side walls and defining, with said convergent wall surfaces, said base, and said flat surface portion of the electrical box, a rectangular section cavity of truncated triangular shape in plan having an opening between said side walls to receive said screw;

a pair of generally wedge-shaped screw-engaging members disposed side by side in said cavity for sliding movement between said inner surface of the base and said flat surface portion of the electrical box; each screw-engaging member including: flat parallel top and bottom faces; two opposite side faces, a first one of which extends parallel to the corresponding face of the other screw-engaging member, and the second one of which extends at an inclination with respect to said first face and parallel to the relevant one of said convergent wall surfaces of the support for sliding movement along said surface, the said first face of the screw-engaging member including co-operating recesses having internal grooves in which together define a thread complimentary to that of a screw to be received in said screw fastening device; and,

spring means extending between said end wall of the support and said screw-engaging members and biassing said members in the direction of convergence of said convergent wall surfaces of the support so as to maintain said first faces of the members in co-operating relationship and said second face in sliding contrast with said convergent wall surfaces;

whereby said screw can be inserted between said screw-engaging members, causing alternate relative movement of the members along said convergent wall surfaces of the support in directions against the biassing effect of the spring means and back to their normal positions under the action of said spring means as the thread on the screw rides over the corresponding thread defined by said recesses, the screw being held in its inserted position by said screw-engaging members and the thread defined by said recesses allowing the screw to be axially displaced by rotation in the appropriate direction.

4,071,159

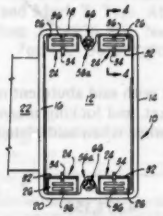
ELECTRICAL JUNCTION AND SWITCH BOXES

Richard L. Robinson, Bryant, and Ivan L. Volgyesy, Camanche, both of Iowa, assignors to Indian Head Inc., New York, N.Y.

Filed June 30, 1976, Ser. No. 701,090

Int. Cl.[2] H02G *3/14*

U.S. Cl. 220—3.2 **1 Claim**



1. A molded synthetic resin electrical service box open at one side thereof and comprising:

at least two walls each intersecting a third wall at substantially a right angle and terminating in side edges opposite the edge intersecting said third wall and adjacent the boundary of the opening at one side of said box;

a flange projecting normal to and secured to each of said two walls adjacent the open side of the box, each of said flanges defining and carrying a tubular portion, and each of said tubular portions defining a screw hole having its axis extending substantially parallel to the adjacent one of said two walls;

break-out windows extending between pairs of intersecting walls at an acute angle to each of said intersecting walls, each of said break-out windows comprising:

a removable panel in a surrounding opening spacing the panel from the remainder of the box; and

means bridging across said surrounding opening and interconnecting the panel with said respective intersecting wall pair; and

spring metal screw-retaining clips pressed into said flanges and each including

a barb engaging a portion of said flange at a location adjacent said tubular portion; and

flange means defining a screw shank receiving opening coaxial with the axis of said screw hole and bounded by the flange means for engaging the threaded shank of a screw extended into the screw hole defined by said tubular portion, and through said flange means-defined opening, with said threaded shank engagement occurring on opposite sides of said screw shank.

4,071,160

INSULATED BEER KEG CONTAINER

Carl J. Vick, Portland, Oreg., assignor to Keg-Tainer, Inc., Portland, Oreg.

Filed Sept. 30, 1976, Ser. No. 728,317

Int. Cl.[2] B65D *7/02, 7/00, 25/00*

U.S. Cl. 220—5 R **13 Claims**

1. A container for a keg of beer or other liquid, comprising:

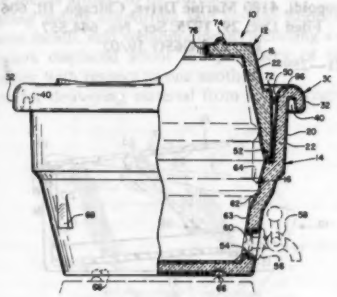
a pair of insulating tubs facing one another in interfitted telescopic relationship about the keg, and separable to facilitate replacement or removal of said keg,

one of the tubs being a deep lower tub of circular horizontal cross section and having a base and an upright sidewall terminating in an annular rim,

said rim providing a hand hold for lifting the container,

said sidewall being of a height exceeding one-half the height of the keg to be contained, so as to dispose said rim at a place above the center of gravity of the keg to avoid tipping tendencies when carrying the keg,

the other of said tubs being an inverted upper tub of smaller



size than that of the lower tub and having a top wall and a depending sidewall of circular cross section telescoped downwardly within the upper portion of the lower tub in separable contact therewith,

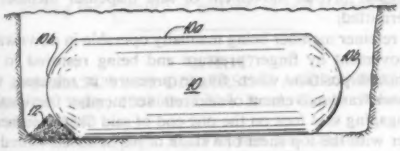
at least one of said tubs having an opening formed therethrough to facilitate tapping the keg while it is insulated by said container.

4,071,161

CYLINDRICAL UNDERGROUND STORAGE TANK HAVING PARTICULARLY SHAPED END CAPS

Agnar Gilbu, Sandefjord, Norway, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Dec. 30, 1976, Ser. No. 755,752
Int. Cl.² B65D *89/06, 7/46*
U.S. Cl. 220—18 **6 Claims**



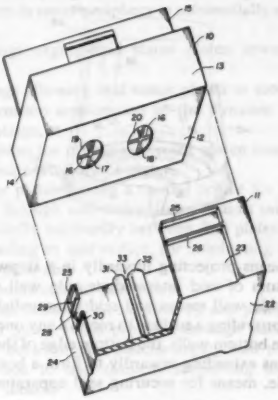
1. A cylindrical storage tank formed of glass fiber reinforced plastic and adapted to be installed underground in a horizontally extending position, the tank comprising a hollow cylindrical body and two end caps joined respectively to opposite end portions of the cylindrical body, the end caps being outwardly convex and generally spherical at their central portions but being frusto-conical adjacent their junctions with the cylindrical body, the radius of curvature of the spherical portions being substantially equal to what it would be for completely hemispherical end caps corresponding in radius to the radius of the cylindrical body and the frusto-conical portion of each end cap forming an angle adjacent the bottom of the tank with an underground support surface when the tank is installed horizontally underground, said angle substantially corresponding to the natural angle of repose of recommended backfill material such as sand or gravel, whereby voids otherwise likely to occur beneath the end caps if the end caps were completely hemispherical are eliminated.

4,071,162

BOTTLE PACK CRATE AND BOTTLE PACK THEREFOR

Rudolf F. Steinlein, Munich, Germany, and Christina Schoeller, Zuoz, Switzerland, assignors to Schoeller International GmbH & Co. KG, Munich-Solln, Germany

Filed Feb. 27, 1975, Ser. No. 553,845
Int. Cl.² B65D *1/24, 25/10*
U.S. Cl. 220—21 **2 Claims**



1. A crate for at least six bottles which is capable of crating bottles held in one or more partitioned packs removable from the crate so that the bottles can be held in the pack during loading into the crate and removal therefrom and is also, alternatively, capable of crating unpacked individual bottles without allowing contact of bottles with each other, said crate comprising a lattice-work crate bottom and upstanding side walls forming a rectangular enclosure comprising:

a plurality of clusters of bottle-separating pillars, extending upward from the crate bottom, each pillar cluster being spaced from the crate wall and composed of at least one pair of closely spaced pillars, the pillars of the same cluster being of similar shape and approximately the same size and being separated over substantially all of their height by at least one narrow substantially vertical-sided slot-like gap running parallel to a pair of said crate side walls for receiving bottle pack partitions,

said pillar clusters being provided at least at two locations on the bottom of said crate, each said location of a pillar cluster defining adjacent cell corner boundaries of four bottle-receiving areas, and the lateral surface of each of said pillars, which surface faces away from the center of the cluster to which the pillar belongs and towards the center of one of said bottle-receiving areas, having a concave portion concave with a smaller radius of curvature than the distance to a vertical axis through said bottle receiving area and presenting substantially vertical edges respectively at each side of the concave portion for engagement of a bottle by both of said edges.

4,071,163

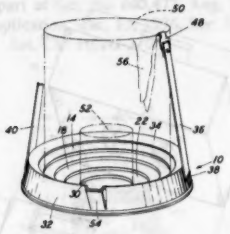
APPARATUS FOR RECOVERING PAINT SPILLS

Michael Martin, 24 Jefferson St., Attleboro, Mass. 02703

Filed Sept. 8, 1976, Ser. No. 721,460
Int. Cl.² B65D *47/40*
U.S. Cl. 220—69 **5 Claims**

1. Apparatus for recovering paint spills from a paint can comprising a receptacle adapted to fit about the bottom of a paint can, said receptacle having a plurality of side wall means extending for a distance beyond the outer periphery of the bottom of a paint can to which such apparatus is attached to provide a gutter for catching paint spills, and to hold any of a plurality of paint cans of varying sizes, said plurality of side

wall means each having a diameter which corresponds to the diameters of the bottom walls of paint cans of varying sizes, the first of said side wall means having a flange projecting inwardly at the bottom thereof to join the upper outer edge of intermediate side wall means in a stepwise manner, said intermediate side wall means extending downwardly from the flange of said first of said side wall means, intermediate side



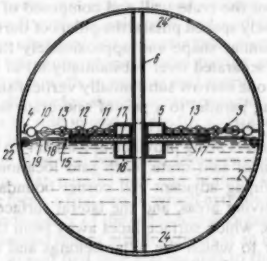
wall flange means projecting inwardly in a stepwise manner from the bottom of said intermediate side wall means, said intermediate side wall means and said intermediate side wall flange means providing a surface to receive any one of a plurality of paint can bottom walls, the bottom edge of the last of said side wall means extending inwardly to form a bottom wall of said receptacle, means for securing said apparatus to a paint can.

4,071,164

FLOATING ROOF OF A TANK FOR STORING LIQUIDS

Mikhail Grigorievich Skakunov, ulitsa Zelenaya, 6, kv. 60, Levoberezhnaya, Moskovskaya oblast, U.S.S.R.

Filed June 8, 1977, Ser. No. 804,588
Claims priority, application U.S.S.R., June 14, 1976, 2372520
Int. Cl.[2] B65D *87/207, 87/18*
U.S. Cl. 220—224 **4 Claims**



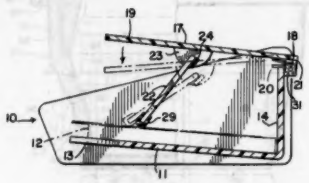
1. A floating roof of a tank for storing liquids, with an upright centrally secured therein, comprising a floating chamber fitted to said upright of said tank with provision for displacement along the upright when the level of liquid in the tank is changing; a space inside said floating chamber filled with a gaseous fluid under an excess pressure; an annular seal the outward edge whereof is in contact with the shell of the tank; said annular seal comprising a plurality of members pivotally interlinked one with another; a resilient disc-shaped diaphragm attached, leakproof fashion, to said floating chamber at the centre and to said floating seal all the way along its circumference; said resilient disc-shaped diaphragm made hollow and corrugated in the radial and circumferential directions; a plurality of cells formed by the corrugations of said resilient disc-shaped diaphragm; said plurality of cells enabling the disc-shaped diaphragm to expand up to the shell of the tank in all transverse directions when the level of liquid in said tank is changing; a framework resting whereon is said resilient disc-shaped diaphragm, said framework consisting of a plurality of radially disposed telescopic arms each attached with one of its ends to said floating chamber and resiliently connected at its free end to said annular seal.

4,071,165

PAPER DISPENSER HAVING A FRICTIONAL DISCHARGE ASSISTANT

Norbert Leopoldi, 4180 Marine Drive, Chicago, Ill. 60613

Filed Dec. 29, 1975, Ser. No. 644,557
Int. Cl.[2] G65G *59/02*
U.S. Cl. 221—259 **3 Claims**



1. A paper dispenser comprising in combination:

a receptacle for storing therein a stack of paper sheets, said receptacle having an open top, a bottom wall, side walls and a rear wall, the front of said receptacle being open to provide a forward discharge opening;

a retainer member hingedly affixed at one end thereof to a top edge of said rear wall substantially centrally between said side walls and overlying said bottom wall;

resilient means engaged with said retainer member and said rear wall for supporting said retainer member in a normal position overlying a stack of paper sheets stored within said receptacle, said resilient means providing only a mild resistance to downward movement of said retainer member under finger pressure and restoring said retainer member to its normal position when finger pressure is released;

a dispenser element having a foot on one end thereof for frictional engagement with the top sheet of a stack of paper sheets stored within said receptacle, said dispenser element being freely pivotally affixed at the other end thereof to said retainer member and being maintained at a forward angle by stop means which prevents rearward motion of said dispenser element such that only forward angular pivotal movement of said dispenser member is permitted;

said retainer member being manually operable in downward movement by finger pressure and being restored to its normal position when finger pressure is released, the downward movement of said retainer member frictionally engaging said foot on the one end of said dispenser member with the top sheet of a stack of paper sheets stored in said receptacle and further causing said dispenser member to pivot in a forward angular movement toward said discharge opening to slide the top sheet of the stack of paper sheets toward said discharge opening, whereby the top sheet is dispensed from said receptacle.

4,071,166

BLAST FURNACE CHARGING METHOD AND APPARATUS

Edouard Legille, Luxembourg, and Rene N. Mahr, Howald-Hesperange, both of Luxembourg, assignors to S.A. des Anciens Etablissements Paul Wurth, Luxembourg, Luxembourg

Filed Mar. 6, 1973, Ser. No. 339,297
Claims priority, application Luxembourg, Aug. 11, 1972, 66430
Int. Cl.[2] F27B *11/12*
U.S. Cl. 222—1 **19 Claims**

1. Apparatus for use in the delivery of materials to the interior of a shaft furnace, said furnace having a vertical axis and

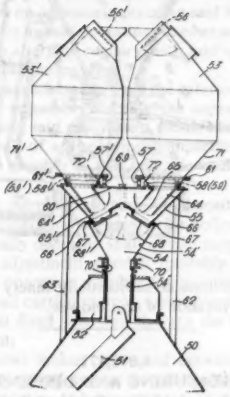
operating with a high counter-pressure, said furnace further having a feed spout, said apparatus comprising:

at least one storage hopper for providing intermediate storage for a charge material to be delivered to the furnace, said storage hopper having a supply port and a discharge port;

frame means affixed to the furnace;

weighing means supporting said storage hopper from said frame means, said weighing means including a plurality of sensors displaced about the periphery of said storage hopper with respect to one another;

means for delivering material from said storage hopper to



the furnace feed spout, said delivery means including a flow control metering valve, said delivery means being supported on the furnace;

compensating means hermetically coupling the exterior of said storage hopper to the exterior of the furnace, said compensating means being characterized by sufficient flexibility to absorb vertical dimensional changes of said furnace resulting from operating conditions while maintaining the hermeticity of the coupling; and

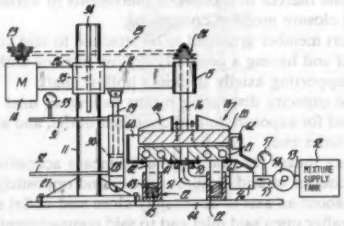
means for biasing said sensors to compensate for forces applied to said storage hopper as a result of furnace operating conditions other than the gravitational force representing the quantity of material in said storage hopper.

4,071,167

APPARATUS FOR DISPERSING AGGLOMERATES

Brian M. Kelly, 1007 Berkshire Road, Grosse Pointe Park, Mich. 48230

Filed Sept. 30, 1976, Ser. No. 728,266
Int. Cl.² B02C *7/08, 7/14*
U.S. Cl. 366—172 **2 Claims**



1. A mill for dispersing the components of a substance into one another comprising,

a stator platen,

a rotor platen,

said rotor platen being superposed on said stator platen in opposed relationship,

means rotatably supporting said rotor platen,

a drive connected to said rotor platen for rotating it relative to said stator platen to develop shear forces between said platens,

said stator platen having an outer periphery;

at least three springs resiliently supporting said stator platen adjacent its outer periphery at substantially equally spaced points;

said springs urging said stator platen toward said rotor platen;

said springs allowing said stator platen to move universally to a position conforming to the dynamic plane of said rotor platen;

power means for urging said rotor platen toward said resiliently supported stator platen;

said stator platen having a central orifice for feeding a substance through said stator platen against said rotor platen and radially outwardly between said platens in a layer;

a pipe leading to said orifice, for conducting a substance to said orifice; and

a pump connected to said pipe;

a substance to be milled supplied by said pump being forced by said pump under pressure through said pipe and said orifice between said platens urging said platens apart in opposition to said resilient supporting means and said power means;

the layer of the substance in traveling between said platens being subjected to the shear forces generated between said platens by their forced proximity and relative rotation to disperse the components of the substance into one another;

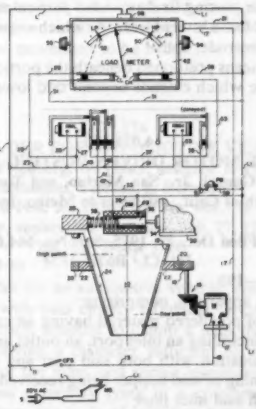
said universally supported stator platen in conforming to the dynamic plane of said rotor platen maintaining uniform spacing between said platens over their opposed surfaces obviating channeling and subjecting the substance being milled to uniform shear forces.

4,071,168

LEVEL CONTROL SYSTEM FOR A ROTARY CONE-TYPE FEED HOPPER

Milton Stone, Chicago, Ill., assignor to Pettibone Corporation, Chicago, Ill.

Filed Apr. 22, 1976, Ser. No. 679,211
Int. Cl.² B67D *5/08*
U.S. Cl. 222—56 **5 Claims**



1. The combination with a vertically disposed, rotatably mounted, feed hopper having a relatively large open upper end for the infeed of flowable material, and a relatively small open end for discharge of such material, an electric motor opera-

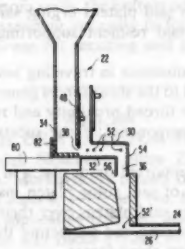
tively connected in driving relationship to said hopper, means establishing a supply of the material for delivery to the hopper, and gate means effective when open to admit material from said supply to the hopper, of a level control system effective to to give an indication of the quantity of material in the hopper during rotation of the latter and at any given instant in order that said gate means may be shifted as a result of said indication from its open to its closed position when the quantity of material in the hopper attains a predetermined maximum, said system embodying a load meter in the form of a dynamometer operatively connected to said motor and having a visible readout in the form of a movable pointer and scale combination, said pointer and scale combination being responsive to the voltage supplied to said motor, and also being responsive to the current consumed by the motor, and thus being responsive to the power expended by the motor in driving said hopper.

4,071,169

ELECTROSTATIC METERING DEVICE

John P. Dunn, 956 Graylea Circle, Elmira, N.Y. 14905

Filed July 9, 1976, Ser. No. 703,982
Int. Cl.[2] B67D *5/06*
U.S. Cl. 222—76 **6 Claims**



1. An electro-static metering device for finely divided particulate matter, said metering device comprising:
   a. two spaced electrodes, one of which is vertically positioned above the other but offset therefrom so that the lower electrode extends beyond the upper electrode on one side of the metering device by a short distance and the upper electrode extends beyond the lower electrode on the opposite side of the metering device by a short distance;
   b. means for placing finely divided particulate matter on the portion of said lower electrode which extends beyond said upper electrode; and
   c. output means positioned beneath the portion of said upper electrode which extends beyond said lower electrode.

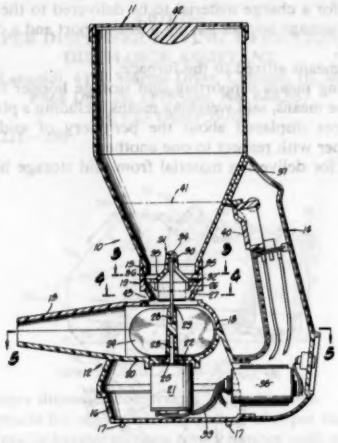
4,071,170

PORTABLE MOTOR DRIVEN DUSTING APPARATUS

Rudolph M. Gunzel, Jr., San Marino, and Tony Radecki, Altadena, both of Calif., assignors to Meiko, Inc., Los Angeles, Calif.

Filed Dec. 29, 1975, Ser. No. 644,608
Int. Cl.[2] B67D *5/54*
U.S. Cl. 222—193 **17 Claims**

1. Dusting apparatus, comprising:
   a hopper of powdered material having an exit opening;
   a housing including an inlet port, an outlet and a chamber in communication with both said port and said outlet, the exit opening of said hopper being received in communication with said inlet port;
   a rotary blower in said chamber; and
   a valving element freely supported in said inlet port having convex portions facing into the hopper exit opening and concave portions facing oppositely;
   driving means intermittently contacting said concave portion of said element and interconnecting said rotary blower and said valving element for vibrating said element



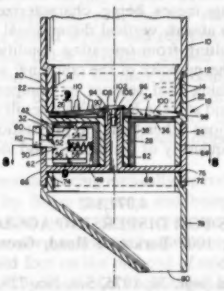
in two directions at substantially ninety degrees to one another on rotation of said blower.

4,071,171

MATERIAL MEASURING AND DISPENSING DEVICE

Anthony L. Bassignani, 17 King St., Norfolk, Mass. 02056

Continuation-in-part of Ser. No. 614,702, Sept. 18, 1975, Pat. No. 4,006,842. This application Jan. 24, 1977, Ser. No. 761,894
Int. Cl.[2] G01F *11/10*
U.S. Cl. 222—305 **11 Claims**



1. A closure member for attachment to an outlet from a container of granulated material for providing dispensing of the contents thereof in successive increments of variable volume, said closure member comprising:
   a support member arranged to be attached to said container outlet and having a generally hollow interior with means for supporting axially therein a hollow shaft;
   variable capacity dispensing means having an inlet end arranged for exposure to said container outlet, and an opposite outlet end;
   operating means for said dispensing means accessible from the exterior of said closure member and oppositely pivotable about an axis to alternately close said outlet end and thereafter open said inlet end to said compartment, and to close said inlet end and thereafter open said outlet end, said operating means including a pair of barrier members respectively associated with said opposite ends of said dispensing means and operable to effect the closing and opening of the ends thereof;

said barrier member associated with said outlet end of said dispensing means having an axial shaft adapted to be projected coaxially through and beyond said shaft of said support member toward the container end thereof, and being secured in a generally hollow operating member forming part of the exterior of said closure member;

the other said barrier member being provided with means for attachment thereof to the end of said barrier member shaft projected through and beyond said support member shaft for demountably rotatably mounting said barrier members to said support member shaft;

each of said barrier members being provided with an opening therethrough spaced angularly about the axis of said shafts so that on oppositely pivoting said barrier members about said axis by said operating member said openings are brought into alternate registry with said opposite ends of said dispensing means; and

adjustment means accessible from the exterior of said closure member for adjustably varying the capacity of said dispensing means, said adjustment means including:

a fixed side wall of a dispensing compartment mounted in said support member so that said side wall extends axially thereof;

an adjustment member carrying an opposite side wall for said compartment having an interior hollow support shaft fitting coaxially over said shaft of said support member to mount said adjustment member rotatably thereon within said hollow operating member for pivoting the compartment side wall carried thereby toward and away from the compartment fixed side wall to vary the capacity of the compartment;

ratchet and pawl means connected between said support member and said adjustment member providing incremental adjustment pivotal movements of said adjustment member; and

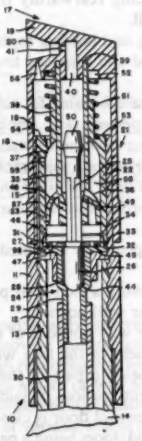
scale means cooperating with said ratchet and pawl means for indicating the different capacities of said compartment at the incremental adjustments provided by said ratchet and pawl means.

4,071,172

MANUALLY OPERATED LIQUID DISPENSER

Stephen M. Balogh, 142 Brentwood Ave., Fairfield, Conn. 06430

Filed Apr. 7, 1976, Ser. No. 674,416
Int. Cl.[2] G01F *11/32*
U.S. Cl. 222—321 **8 Claims**



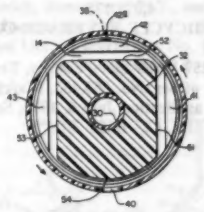
1. A liquid dispenser for attachment to a liquid container comprising two telescopic sleeves slidably connected together, one sleeve comprising a base section having means to engage the mouth of a container and the second sleeve comprising an actuator section having a finger rest and a spray nozzle; spring means located between said finger rest and said second sleeve for yieldably holding said base section and said actuator section in extended condition; and a pump unit sandwiched in toto between said base section and said actuator section, said pump unit having a cylinder having an inlet portion having a dip tube adapter and an outlet portion communicating with said spray nozzle of said actuator section to force liquid drawn from the container out through said nozzle when said base section and actuator section are reciprocated relatively by manual force applied to said finger rest and force applied by said spring.

4,071,173

COVER ENCLOSING FLAT SIDED BUTTON FOR ACTUATION PREVENTION

Paul F. Horan, Huntington, Conn., assignor to VCA Corporation, Baton Rouge, La.

Filed Nov. 22, 1976, Ser. No. 743,589
Int. Cl.[2] F16K *35/10*
U.S. Cl. 222—321 **8 Claims**



1. An actuator assembly for a dispensing device comprising, in combination:

a. a cap body piece having means for attachment to a container and a series of tab means projecting upwardly from said cap body piece;

b. an operable dispensing button and means movably mounting said button on said cap body piece for both turning and axial movement, said button having a series of flat sides and one curved side, said flat sides being arranged to be received within said tab means when properly positioned;

c. cover means enclosing said button adapted to expose a portion of the button for finger engagement; and,

d. guide means on said button and said cover piece for preventing relative turning therebetween while enabling relative axial movement to be had.

4,071,174

MAP HOLDER FOR AUTOMOTIVE VEHICLE

Rudolf Weiner, Friedberg, Germany, assignor to Firma Weiner Geratebau - Stahlmobel, Friedberg, Germany

Filed Feb. 26, 1976, Ser. No. 661,771
Claims priority, application Germany, Feb. 27, 1975, 2508599
Int. Cl.[2] B60R *1/00*
U.S. Cl. 224—29 M **10 Claims**

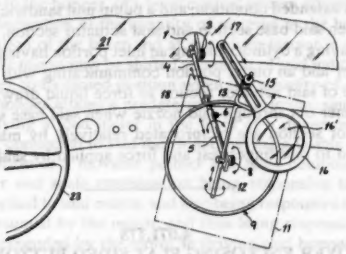
1. A map holder for an automotive vehicle, comprising:

a coil spring with two closely adjoining circular turns of about 360° each adapted to clamp a map therebetween, said turns having a diameter sufficient to encompass a major area of the map, said spring terminating in a first and a second extremity lying in a common plane and extending from the ends of said two turns in generally opposite directions from a plane tangent to said turns;

said second extremity being substantially perpendicular to said tangent plane;

support means engaging said first extremity for securing said

spring to an inner vehicle surface adjacent a driver's seat; and



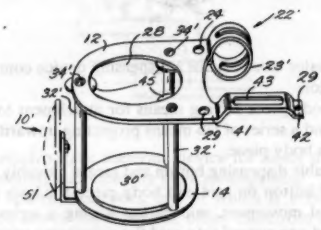
viewing-aid means for facilitating reading of the map on said second extremity in a position confronting the encompassed area of a map inserted between said turns.

4,071,175

ANTI-RATTLE BICYCLE BEVERAGE CONTAINER HOLDER

Van C. Wagnon, 27257 Wells Lane, Conroe, Tex. 77301

Continuation-in-part of Ser. No. 563,452, March 31, 1975, Pat. No. 3,928,284. This application July 6, 1976, Ser. No. 702,926
Int. Cl.² B62J 7/06
U.S. Cl. 224—36 **10 Claims**



1. A holder for a beverage can or the like for mounting on a bicycle handlebar or the like, said holder comprising

a top plate member, said top plate member having a generally circular opening therein of slightly larger diameter than the diameter of a can or the like to be held by the holder,

a bottom plate member, said bottom plate member having dimensions generally the same as or greater than the diameter of the opening in said top plate member,

a plurality of rods spacing and interconnecting said top and bottom plate members,

said rods each being of a length substantially less than the length of a can or the like to be held by the holder, whereby a can or the like will have a portion thereof extending substantially upwardly from said top plate member,

a resilient material washer disposed between each of said plurality of rods and said upper plate extending radially into said top plate member opening for engaging and preventing clattering of a beverage can or the like received by the top plate member opening, and

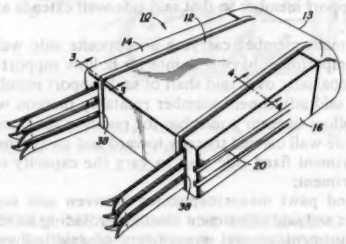
extension means formed integrally with said top plate member for positioning said top plate member on a bicycle handlebar or the like so that the top surface of said top plate member is substantially level with the handlebar or the like, said extension means comprising an elongated strip integral with said top plate member at one end thereof and being free of the other end thereof, and having openings formed therein adjacent either end thereof for receipt of fastening means for holding the extension in the form of a loop wrapped around the handlebar or the like.

4,071,176

CAR TOP SKI AND SKI-GEAR CARRIER

John Tuzee, 2729 Jacquelyn Lane, Waukegan, Ill. 60085

Filed Feb. 11, 1976, Ser. No. 657,169
Int. Cl.² B60R 9/04
U.S. Cl. 224—42.1 E **7 Claims**



1. A streamlined carrier for skis and other articles comprising

a rigid housing having interior storage space for said articles,

said housing having a streamlined forward end wall, a rear end wall, opposite side walls disposed at the forward end only of said housing, and top and bottom walls,

said top wall being generally T-shaped, having a longitudinal leg portion extending rearwardly from a transverse cross portion disposed at the forward end of said housing adjacent said side walls,

said housing having side openings for permitting access to said space extending rearwardly from said side walls to said rear end wall,

means for mounting said housing to the exterior of a vehicle with said forward end disposed toward the front of said vehicle,

means mounted to said housing for supporting a plurality of skis across said openings with one end portion of each of said skis extending into the forward portion of said interior storage space beneath said transverse cross portion of said top wall and with the other end portions of said skis extending rearwardly from said carrier adjacent said rear wall,

a pair of doors respectively mounted to said housing over said openings

said doors each having a side wall portion, an upper wall portion and a rear wall portion,

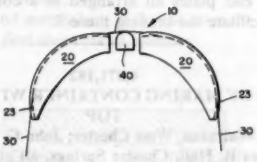
said upper and rear wall portions of each of said doors extending transversely of the side wall portion of each of said doors and being a part of the same contour of the respective adjacent portions of said top and rear walls of said housing when said door is closed, said side wall portion of each of said doors being a part of the same contour of the respective side wall of said housing when said door is closed,

whereby said door prevents access to said storage space, prevents removal of said skis, and protects all but said other end portons of said skis from the elements.

4,071,177
SELF-CENTERING AIR GUIDE FOR TAPE TRANSPORTS

Donald L. Burdorf, Newport Beach, Calif., assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Continuation-in-part of Ser. No. 521,882, Nov. 7, 1974, Pat. No. 3,979,037. This application July 10, 1975, Ser. No. 594,855
Int. Cl.² B65H *17/32*
U.S. Cl. 226—7 **11 Claims**



1. A method of guiding a span of recording tape in a self-centering relation to the center line of a support surface having a pair of beveled flanges formed along its longitudinal sides which are spaced apart at their base a distance less than the minimum width of the recording tape, said method comprising:

transporting the recording tape along the support surface;

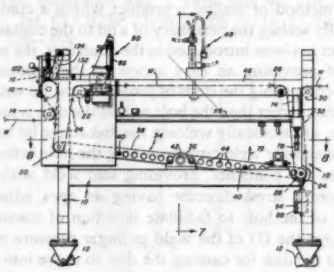
tensioning the recording tape so as to maintain it in close proximity to said support surface; and

providing air under pressure along a portion of said support surface so that a film of pressurized air is generated between said tape, support surface and beveled flanges sufficient to lift said tape off said support surface to a point where its width substantially equals the horizontal distance between said beveled flanges, thereby maintaining said tape in a centered relationship with respect to the centerline of said support surface.

4,071,178
MACHINE FOR USE WITH MOVING WEBS

Robert M. Copp, 271 Thames St., Bristol, R.I. 02809

Filed June 7, 1976, Ser. No. 693,165
Int. Cl.² B65H *23/18*
U.S. Cl. 226—39 **11 Claims**



8. A machine for temporarily interrupting a segment of a web of continuously moving material comprising:

a frame having a web receiving end and a web delivery end;

roller means defining a path of web travel through the machine, said roller means being constructed and arranged to define web loops of variable size at the web receiving and web delivery ends of the frame;

brake means mounted to the frame for gripping the web at a location between the web receiving and web delivery ends for stopping further advancement of a segment of the web;

said roller means including a pair of nip rollers mounted to the frame at the web receiving end thereof and in advance of the variable size loop at the web receiving end;

means responsive to a predetermined angular revolution of one of said nip rollers for operating the brake means and for beginning a new measurement of the angular rotation of said one of said nip rollers;

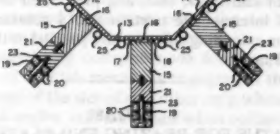
said means responsive to said predetermined nip roll revolutions comprising an optical shaft encoder having an input shaft directly connected to said nip roller; and means mounting the shaft encoder for limited movement in all directions except for rotation about the axis of the nip roll; and

said loop forming means being constructed and arranged to enable delivery of a previously looped segment from the loop at the delivery end and to enable take up of web from the nip roller while said brake means is in gripping engagement with the web.

4,071,179
APPARATUS AND METHODS FOR FLUXLESS SOLDERING

John N. Antonevich, Jamestown, N.Y., assignor to Blackstone Corporation, Jamestown, N.Y.

Filed Oct. 31, 1975, Ser. No. 627,761
Int. Cl.² B23K *3/06*
U.S. Cl. 228—1 A **6 Claims**



1. A solder pot comprising in combination an elongated pot for containing molten solder, the cross section of said pot transverse to its length being in the form of a generally half octagon having two vertical sides, a flat bottom and two sloping sidewalls connecting the vertical sides and bottom at least one elongate coupling member extending longitudinally of said vessel on each of said bottom and sloping sidewalls and fixed on the outside thereof in energy transfer relation therewith, a multiplicity of vibratory transducers equally spaced along said coupling member and affixed thereto, a power generator and oscillator connected commonly to all said transducers for energizing the same and means for uniformly heating the vessel and metal therein, each of said coupling member having a lengthwise central recess along its top edge bordered by parallel spaced contact surfaces in contact with the vessel wall and attached to said wall.

4,071,180
APPARATUS FOR PREFORMING WIRE LEADS AND ALIGNMENT FOR BONDING

Jean Marcel Dupuis, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Oct. 4, 1976, Ser. No. 729,485
Int. Cl.² B23K *21/02*; H01L *21/601*
U.S. Cl. 228—1 R **23 Claims**

1. Apparatus for preforming unsupported inner ends of cantilever wire leads of lead frames, for bonding said inner ends of said leads to contacts, said lead frames being in a continuous strip and including perforations along each side of said strip and in a predetermined positional relationship with said lead frames, comprising:

means for successively feeding lead frames to a preforming position;

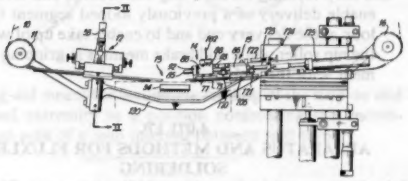
positioning means for positioning each lead frame in a prede-

termined position at said preforming position, said inner ends of said leads extending over a recessed die;

preforming means at said preforming position and including a support member and a support table extending under said support member, said recessed die supported on said support table;

said positioning means including locating plungers axially slidable in said support member, one on either side of said die and having lower ends for passing through said perforations;

said preforming means including a further plunger axially slidable in said support member and having a lower end



for bending said inner ends of said leads out of the plane of the lead frame, said further plunger positioned over said die;

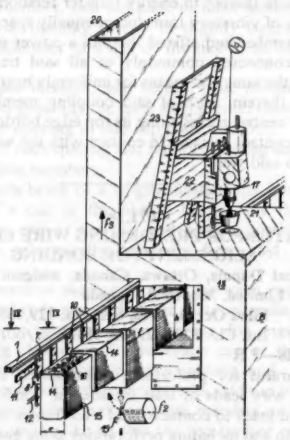
actuating means extending over the upper ends of said locating plungers and said further plunger and moveable towards said support member, initial movement of said actuating means sliding said locating plungers to engage their lower ends in said perforations and continued movement sliding said further plunger to preform said inner ends of said leads, each end preformed to include an inclined intermediate portion and a substantially flat end portion extending substantially parallel to the plane of said lead frame.

4,071,181

APPARATUS FOR BRAZING END PLATES AND THE LIKE

Alain Edouard Plegat, Asnieres, France, assignor to Societe Anonyme des Usines Chausson, Asnieres, France

Filed Oct. 15, 1975, Ser. No. 622,646
Claims priority, application France, Nov. 20, 1974, 74 38194
Int. Cl.[2] B23K *31/02*; F28F *9/16*
U.S. Cl. 228—43 **10 Claims**



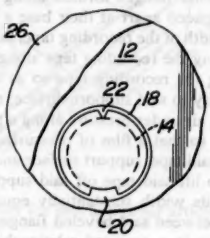
1. An apparatus for brazing of end plates and the like onto tubes of variable sized heat exchangers having a plurality of work stations, said apparatus including a brazing station and conveyor means comprising endless guiding means at least in part extending in a horizontal path, a plurality of upright support bars movably carried by said guiding means and connected together for common motion along said guiding means, each of said support bars carrying fitting means, the fitting means of adjacent support bars being adapted to engage the bottom side of the end plate of a given heat exchanger and each of said fitting means being disposed at a common height on said support bars whereby each of said heat exchangers may be successively conveyed through the brazing station with the uppermost end plates all arranged in a common horizontal plane to facilitate the brazing thereof.

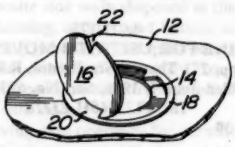
4,071,182

METHOD OF MAKING CONTAINER WITH EASY OPEN TOP

Thomas A. Walraven, West Chester; John G. Thomas, Berwyn, and James B. Hall, Chester Springs, all of Pa., assignors to Christiana Metals Corporation, West Chester, Pa.

Division of Ser. No. 720,533, Sept. 7, 1976, Pat. No. 4,036,397.
This application Feb. 22, 1977, Ser. No. 771,050
Int. Cl.[2] B23K *1/06*
U.S. Cl. 228—110 **4 Claims**





1. In a method of sealing a product within a container by hermetically sealing the periphery of a lid to the container after the product has been introduced in the container, the improved method of providing an easy access to the product in the container comprising the steps of providing the lid with a hole, placing a disk larger than the hole so that the disk is juxtaposed to the hole, ultrasonically welding the disk to the lid to thereby provide an annular weld circumscribing the hole before the lid is sealed to the container, providing said weld with a hinge spaced from a stress director having an apex adjacent the periphery of the hole to facilitate initiation of tearing of the disk adjacent the ID of the weld as finger pressure is applied directly to the disk for causing the disk to move into the container with said disk remaining connected to the lid at said hinge.

4,071,183

FABRICATION METHOD AND FABRICATED ARTICLE

Richard M. Cogan, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Division of Ser. No. 569,183, April 18, 1975, Pat. No. 3,996,019.
This application Jan. 29, 1976, Ser. No. 653,591
Int. Cl.[2] B23K *19/00*
U.S. Cl. 228—173 A **4 Claims**

1. In a method of fabricating a non-planar article including a portion of non-uniform sectional thickness from a plurality of

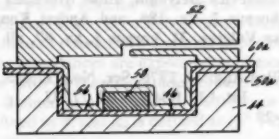
members including a plurality of cooperating sheet metal members and at least one insert member, each sheet metal member having a bonding surface which cooperates with a bonding surface of another member, the steps of:

placing a first metal sheet in a die;

shaping a first non-planar sheet metal member from the first metal sheet in the die by applying fluid pressure to a face of the first metal sheet;

with the first sheet metal member in the die, positioning at least one of the insert members on a surface of the first sheet metal member;

placing a second metal sheet in the die over the insert member and the first sheet metal member;



shaping a second sheet metal member by applying fluid pressure to a face of the second metal sheet to press the second metal sheet over the insert member and the first sheet metal member to retain the insert member between the sheet metal members and to provide a preliminary assembly;

placing the preliminary assembly in an autoclave; and then

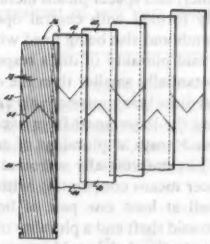
conducting a solid state diffusion bonding of the sheet metal members at cooperating bonding surfaces in the autoclave including the concurrent application of fluid pressure and heat.

4,071,184

IMPACT RESISTANT BLADE

Robert G. Carlson, Greenhills, and Robert W. Harrison, Cincinnati, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Division of Ser. No. 643,495, Dec. 22, 1975, Pat. No. 4,000,956.
This application Aug. 2, 1976, Ser. No. 710,389
Int. Cl.[2] B23P *15/04*; B32B *31/18, 15/14*
U.S. Cl. 228—159 **2 Claims**



1. In a method of fabricating a filament laminate for use in a composite article, the steps of:

bonding a plurality of collimated filaments between two sheets of a first material;

removing a portion of at least one sheet from the laminate;

replacing said removed portion with a second material characterized by an impact strength different from that of said removed portion; and

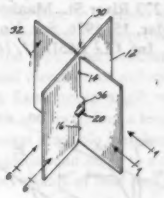
bonding said second material to said first material.

4,071,185

STRUCTURE FOR LOCKING PARTITIONS IN OPEN POSITION

Charles Luther Peters, Jr., Norco, Calif., assignor to Box Inards, Inc., Anaheim, Calif.

Filed June 28, 1976, Ser. No. 700,386
Int. Cl.[2] B65D *5/48*
U.S. Cl. 229—28 R **3 Claims**



1. A partition comprising:

a pair of vertical partition strips having respective vertical slots,

said strips being intersected via said slots, the inner portion of the slot in one strip being enlarged, the sides of said enlarged portion having shoulders adjacent the inner end of said portion;

tab means attached to the inner end of said enlarged slot portion,

said tab means prior to interlocking of said strips being coplanar with said one strip and filling said enlarged slot portion, whereby the outer end of said tab means spans the narrow portion of the slot of said one strip, and said outer tab end is engaged by the inner end of the slot in the other strip prior to interlocking of said strips,

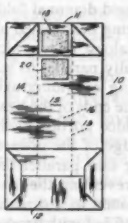
said tab means being collapsible via force applied to the outer end of said tab means via engagement therewith of the inner end of the slot of said other strip when said strips are at right angles, said tab means when collapsed extending along said other strip to prevent its rotation relative to said one strip, and the body of said tab means when collapsed by said other strip being captured between the inner end of said enlarged slot portion and said shoulders adjacent thereto, whereby said strips are automatically interlocked upon forcing them together when intersected via said slots.

4,071,186

SELF-CLOSING BAG

Raymond J. Ruda, Chicago, Ill., assignor to Bagcraft Corporation of America, Chicago, Ill.

Filed June 15, 1976, Ser. No. 696,270
Int. Cl.[2] B65D *33/16*
U.S. Cl. 229—62 **5 Claims**



1. A self-closing bag comprising: a bag having a front side and a rear side extending to the mouth of the bag, said front side having an opening at the mouth of the bag, a first cohesive coating carried on an insert secured to the inner surface of said rear side in registration with said opening, said insert compris-

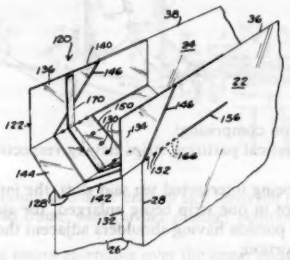
ing material removed from said front side to provide said opening, and a second cohesive coating carried on the outer surface of said front side adjacent to said opening and facing the same way for cooperation with said first cohesive coating when the mouth-end of the bag is folded over.

4,071,187

VALVE BAG

Arthur E. LaFleur, 273 River St., Manistee, Mich. 49660

Filed Mar. 15, 1976, Ser. No. 667,098
Int. Cl.[2] B65D *31/14*
U.S. Cl. 229—62.5 **11 Claims**



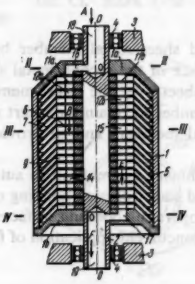
1. A vented bag formed of a thermoplastic sheet material having a pair of side walls connected along their vertical edges by inwardly gusseted end walls, said side walls being heat sealed together along a generally straight line at the upper ends thereof to form a top closure for the bag, at one upper corner portion of the bag one end wall having a portion thereof folded inwardly along a line extending between the adjacent vertical edges of the two side walls and spaced downwardly from the top closure seal such that in the flattened condition of the bag the inwardly folded portion of said end wall cooperates with the portion of the end wall immediately below it to define a pair of double thickness, triangularly-shaped panels sandwiched between the adjacent portions of the side walls, said side walls being folded inwardly along lines extending diagonally inwardly and upwardly from the opposite ends of the last-mentioned fold line on the end wall to the line of sealing at said top closure, said inwardly folded end and side walls defining an opening at said corner of the bag, a tubular sleeve of thermoplastic sheet material disposed in said opening, said sleeve comprising an axially outer end portion which extends outwardly from the inner edge of the inwardly folded portion of said end wall and an axially inner portion which extends downwardly from said inner edge of the inwardly folded portion of said end wall, said tubular sleeve being connected to the inner edge of said inwardly folded portion of said end wall by a continuous heat seal, said outer end portion of said sleeve being heat sealed to said inwardly folded portion of said end wall adjacent said fold line thereon and also being heat sealed to each side wall along said diagonal fold lines, said inner end portion of said sleeve being heat sealed along said top closure and to both side walls along lines which are spaced downwardly from and generally parallel to said top seal, said last-mentioned lines of sealing extending axially inwardly of the opening from the opposite ends of the heat seal along said inner edge of the inwardly folded portion of the end wall, said heat seals along said inner edge of the inwardly folded portion of the end wall and along said parallel lines on the inner end portion of said sleeve preventing the inner end portion of the sleeve from being displaced in a direction outwardly of the opening when the bag is filled with product, said seals defining a pair of first passageways extending from inside the bag in a direction outwardly of the opening to said diagonal seals between the sleeve and each side wall and a second air passageway extending circumferentially of the opening from the outer ends of the first passageways and between the inwardly folded portion of the end wall and the axially outer end portion of said sleeve, and means providing vent holes in said second passageway to permit the escape of air therefrom to the exterior of the bag while the bag is being filled with product through a filling spout inserted into said sleeve and also after the bag is filled and the sleeve is collapsed against itself into a flattened condition by the product in the bag.

4,071,188

CENTRIFUGAL SEPARATOR FOR TREATING LIQUIDS

Mikhail Egorovich Afonin, ulitsa Krasny Mayak 7, korpus 2, kv. 76; Petr Nikolaevich Belyanin, ulitsa Marshala Tukhachevskogo, 23, korpus 2, kv. 186, and Andrei Konstantinovich Ivanov, ulitsa Volgina, 31, korpus 1, kv. 87, all of Moscow, U.S.S.R.

Filed Aug. 23, 1976, Ser. No. 717,003
Int. Cl.[2] B04B *1/08, 11/02*
U.S. Cl. 233—29 **7 Claims**

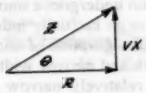


1. In a liquid-treating centrifugal separator, support means, a shaft supported for rotation about its axis by said support means, a hollow shell rigidly coupled coaxially with and surrounding said shaft so as to rotate therewith, said shell having a hollow interior surrounding said shaft, tray means situated in the hollow interior of said shell, said tray means including a stack of trays of a given outer diameter respectively formed with central openings through which said shaft extends, and said trays of said tray means also being fixed to said shaft for rotation with said shaft and shell, and spacer means cooperating with said trays of said tray means for maintaining said trays spaced from each other, said spacer means including a plurality of disks respectively formed with central openings through which said shaft extends and also being fixed with said shaft for rotation therewith, said plurality of disks respectively having outer diameters substantially smaller than the outer diameters of said trays and said disks being respectively situated between said trays for spacing the latter apart from each other and for creating between said trays a plurality of intertray spaces which respectively circumferentially surround said disks, said tray means and spacer means cooperating with each other for defining in said shell at least one pair of liquid-flow paths extending parallel to said shaft and a plurality of arcuate liquid-flow paths respectively situated in said intertray spaces adjacent the outer peripheries of the disks and extending from one to the other of said pair of paths, said one path being a path for receiving liquid to be treated while said other path forms a discharge path for treated liquid, so that lighter liquid components will travel along said arcuate paths from said one to said other path, while heavier liquid components will due to centrifugal force move outwardly beyond said arcuate paths toward the peripheries of said trays to be separated from the lighter liquid components and to be prevented from discharging with the lighter liquid components through said other path.

4,071,189
SLIDE RULE CURSOR

Faiz Mohammad Qureshi, 10456-19th South, Seattle, Wash. 98168

Filed Sept. 22, 1975, Ser. No. 615,395
Int. Cl.[2] G06G *1/02*
U.S. Cl. 235—70 B 6 Claims



1. A cursor for slide rules, said cursor being adapted for use in association with a selected scale on the slide rule to determine a vector coefficient μ_θ which in turn is useful for computing the resultant of two known complex impedances when said two complex impedances are expressed in phasor vector form, wherein the ratio of the magnitudes of said two complex impedances is defined as ρ, the absolute difference between their angles is defined as θ, and μ_θ is defined as $(\rho^2+2\rho\text{Cos}\theta+1)^{1/2}$, said cursor comprising:

a. cursor face plate means having displayed on one surface thereof first and second co-ordinate axes and at least one coefficient curve defined relative thereto, said first co-ordinate axis representing values of ρ, said second co-ordinate axis representing values of μ_θ, and said coefficient curve being a precalculated locus of points relating μ_θ to ρ for one selected value of θ; and

b. cursor frame means for holding said face plate means in operative relationship with said slide rule and adapted to permit movement of said face plate means along said selected scale of the slide rule, said frame means further including means permitting movement of said face plate means perpendicular to said selected scale, said second co-ordinte axis and hence said coefficient curve being so scaled and arranged relative to the selected scale on the slide rule that, in operation to determine μ_θ for two selected complex impedances,

i. said face plate means is first positioned such that said first co-ordinate axis passes through the value of ρ on said selected scale for said two selected complex impedances, and

ii. said face plate means is then moved sufficiently perpendicularly that said selected scale passes through said value of ρ on said first co-ordinate axis, such positioning of said face

plate means resulting in said coefficient curve passing through the correct value of μ_θ on said selected scale for said two selected complex impedances, said value of μ_θ being useful to calculate the resultant of said two selected complex impedances.

4,071,190
THERMOSTATIC VENT CONTROL

Edward B. Ford, Jr., 6405 Bardu Ave., Springfield, Va. 22152

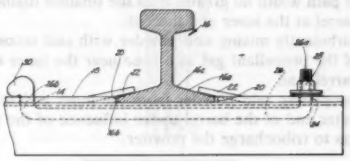
Filed June 8, 1976, Ser. No. 693,862
Int. Cl.[2] G05D *23/275*
U.S. Cl. 236—93 A 5 Claims

1. Automatic thermostatically controlled damper means for a vent pipe comprising in combination, a flap plate substantially the same diameter as that of said pipe rotatable in said pipe about a pivot axis perpendicular to the axis of said pipe, a thermostat control device with a member movable above a predetermined temperature in an axial direction, mounting means positioning said control device inside said vent pipe to cause movement in the axial direction of said thermostat member to rotate said flap plate about said axis from a position substantially closing said pipe in a plane substantially perpendicular to the pipe axis to a position approaching a plane passed through the axis of the pipe, and structure in said mounting means holding the axial direction of movement of said control device disposed at a fixed acute angle with a plane passed through said pivot axis and including a lever member disposed to contact the thermostat movable member and said flap plate, wherein said actue angle is at an angle to a diametric line in said pipe formed by the pivot axis of said flap plate.

4,071,191
TIE PLATE FASTENER SYSTEM

Charles M. Hutton, Norval, Canada, assignor to Armco Steel Corporation, Middletown, Ohio

Filed June 28, 1976, Ser. No. 700,573
Claims priority, application Canada, Oct. 9, 1975, 237312
Int. Cl.[2] E01B *9/32*
U.S. Cl. 238—338 10 Claims



1. A tie plate fastener system for connecting a pair of spaced rails to a tie comprising:

a. a metallic channel tie of U-shaped cross section with the legs thereof opening downwardly and the base thereof having at each end at least one pair of openings spaced from the edges of a rail base when in position on said tie;

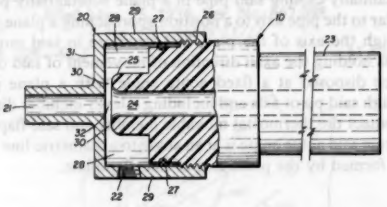
b. a pair of tie plates for each said rail located on either side thereof, each tie plate having forward edge portions lying substantially adjacent the sides of said rail base and a central raised and elonated portion overlying the upper surface of said rail base, said tie plates being of a width substantially identical to the width of said tie and of a length to be provided with openings therethrough in positions corresponding to said openings in said tie; and

c. a single fastening means extending through each said at least one pair of openings for securing said pair of tie plates, and thus its respective rail, to said tie, said fastening means comprising a U-bolt, having an elongated base and upstanding legs, said legs being of a length just sufficient to enable mounting of said U-bolt with said elongated base portion thereof lying just under the underside of the base of said channel tie, the free end of one of said legs being threaded and provided with a nut and the free end of the other of said legs being hooked-shaped, with said hook-shaped end extending outwardly and away from said rail, said hook-shaped end and said nut bearing against the said tie plates and securing them tightly against said base of said channel tie, whereby said tie plates and said single fastening means results in a more positive connection of said rail to said tie and thus reduces rail spreading.

4,071,192
TRIBO-ELECTRO-GAS-DYNAMIC POWDER CHARGING APPARATUS

James Lewis Myers, Golden, Colo., assignor to Coors Container Company, Golden, Colo.

Filed Mar. 29, 1976, Ser. No. 671,354
Int. Cl.[2] B05B 5/00; B44D 1/12
U.S. Cl. 239—3 7 Claims



1. A method of tribo-charging powder comprising

a. directing a propellant gas radially inwardly past a semi-toroidal section at the inner end of a barrel having a non-decreasing inner diameter from the inner end of the barrel to the outer end of the barrel, a first portion of said propellant gas following the semi-toroidal section under influence of the coanda effect to form a boundary layer against the inner wall of the barrel, and a second portion of the propellant gas detaching from the semi-toroidal section in turbulent fashion,

b. directing a supply of powder into said inner end of the barrel along a path axially aligned with the barrel axis and of path width no greater than the smallest diameter of the barrel at the inner end thereof,

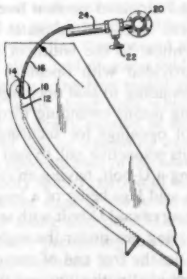
c. turbulently mixing said powder with said second portion of the propellant gas in a zone near the inner end of the barrel, and

d. propelling said powder from the inner end through the outer end of the barrel under influence of the propellant gas to tribocharge the powder.

4,071,193
METHOD OF AND APPARATUS FOR FLOW SPREADING

Arthur J. Sternby, Middletown, and Ronald D. Cruea, Carlisle, both of Ohio, assignors to The Black Clawson Company, Middletown, Ohio

Filed July 19, 1976, Ser. No. 706,583
Int. Cl.[2] B05B 1/26
U.S. Cl. 239—11 10 Claims

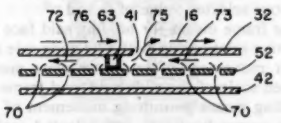


1. In combination with apparatus having a curved, relatively wide, material treating surface including an upstream end and a downstream end, an improved flow spreader for converting a relatively narrow flow of material to a relatively wide flow of material, said flow spreader comprising: a generally imperforate plate having a lower edge extending substantially co-extensively with said upstream end of said material treating surface, said plate having a relatively sharply curved surface with respect to the curved surface of said material treating surface, and a conduit having a relatively narrow width with respect to the width of said material treating surface and having an outlet thereof directed non-tangentially with respect to said curved surface of said plate and towards an upper portion thereof, whereby material impinging on said curved plate surface from said conduit undergoes a smooth but rapid change of direction, resulting in an inertially induced redimensioning of the cross-sectional configuration of said flow from a stream of relatively deep depth and narrow width approximating the configuration of said relatively narrow conduit outlet to a stream of relatively shallow depth and wide width approximately the width of said relatively wide material treating surface.

4,071,194
MEANS FOR COOLING EXHAUST NOZZLE SIDEWALLS

Terry T. Eckert, Fairfield, Ohio, and Edward C. McDonough, Lawrenceburg, Ind., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 28, 1976, Ser. No. 736,299
Int. Cl.[2] B64D 33/08
U.S. Cl. 239—127.3 9 Claims



1. An exhaust nozzle sidewall heat shield and cooling means comprising:

spaced heat shield means positioned over the nozzle sidewall portion exposed to high temperature gases;

means included in said heat shield means for directing cooling air from areas in register with the sidewall portion to opposed surfaces of said heat shield means exposed to high temperature gases; and

means secured to said nozzle and slidably receiving said heat shield means,

said heat shield means exposed to high temperature exhaust gases secured to said nozzle at the forward end and allowed to expand longitudinally and transversely therefrom so as to avoid warping and distortion due to changing temperatures of the exhaust gases.

4,071,195
SPRAY AND FOAM PRODUCING NOZZLE APPARATUS

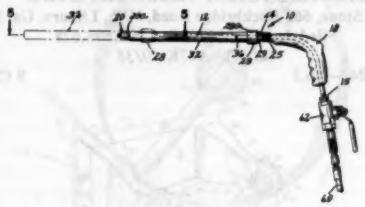
Garrett D. Kuhns, Eagan, Minn.; Norman E. Astorp, Sumner, Iowa; Richard V. Mullen, Cottage Grove, Minn., and John Ellwood Thomas, Riverfalls, Wis., assignors to Economics Laboratory, Inc., St. Paul, Minn.

Continuation-in-part of Ser. No. 612,865, Sept. 12, 1975, Pat. No. 3,961,754. This application June 7, 1976, Ser. No. 693,650
Int. Cl.[2] B05B 15/00
U.S. Cl. 239—289 15 Claims

1. A convertible spray and foam producing nozzle apparatus, comprising:

a. spray-forming nozzle means having an inlet port suitable for receiving a pressurized flow of surfactant bearing fluid therethrough, for forming a spray from fluid received by said inlet port and for directionally projecting said spray in a predetermined pattern outwardly from said nozzle means;

b. foam-forming means cooperatively connected with said spray-forming nozzle means and operatively movable between first and second positions relative to said spray-

forming nozzle means for selectively producing foam from said spray, said foam-forming means being operative in said first position to enable said spray-forming means to uninterruptedly directionally eject its produced spray pattern externally of said nozzle apparatus, and being operable in said second position to intercept said spray, to convert said spray into a foam and to directionally project

in a generally fan-shaped pattern said foam outwardly from said nozzle apparatus; and

c. positioning means cooperatively connecting said spray-forming nozzle means and said foam-forming means for selectively securing said foam-forming means relative to said spray-forming means, between its said first and second positions.

4,071,196

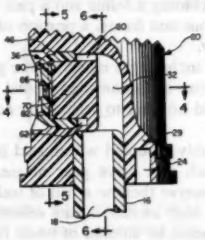
AEROSOL VALVE TIP AND INSERT ASSEMBLY

James E. Burke, Huntington, Conn., and Anthony J. Grzesiak, Burnham, Ill., assignors to VCA Corporation, Baton Rouge, La.

Continuation of Ser. No. 608,763, Aug. 28, 1975, abandoned. This application Oct. 26, 1976, Ser. No. 735,796

Int. Cl.[2] B05B *1/34*

U.S. Cl. 239—492 **5 Claims**



1. An aerosol valve tip and insert assembly which produces a fine, efficient spray over a broad pressure range comprising:

a. a tip member means having:

i. a central discharge bore means adapted to frictionally fit the discharge stem of a dispenser,

ii. an annular side recess means,

iii. a connecting passage means communicating with said bore and said recess means,

iv. a cylindrical post means having a generally flat, circular front face, said cylindrical post means being encircled by said annular side recess means, and

b. cup-shaped insert means adapted to be frictionally fitted onto said cylindrical post means, said insert means having:

i. a transverse front wall provided with a central discharge opening means, the inside surface of said front wall having a central circular swirl chamber means communicating with said central discharge opening means, and a plurality of tapered channel means extending outwardly from said swirl chamber means, said tapered channel means being tapered toward said swirl chamber means, said tapered channel means connecting said swirl chamber means with cylindrical manifold means, and

ii. a plurality of interconnected equilateral side walls perpendicular to said front wall which form a polygon and which fit into said annular side recess to form a plurality of longitudinal channel means for conveying fluids from said central discharge bore means to said cylindrical manifold means, each of said longitudinal channel means being positioned so that a major portion of said longitudinal channel means lies between two of said entrance ends of said plurality of tapered channels, the diameter of said discharge opening means being equal to from about 1/5 to about $\frac{1}{2}$ of the diameter of said swirl chamber means, and the ratio of the width of the exit end of said tapered channels to the entrance end of said tapered channels varies from about $\frac{1}{4}$ to about $\frac{3}{4}$.

4,071,197

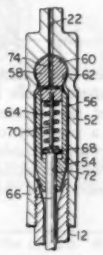
FUEL INJECTOR WITH SELF-CENTERING VALVE

John M. Bailey, Dunlap, and Ronald R. Robinson, Morton, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 659,611, Feb. 19, 1976, abandoned. This application Mar. 7, 1977, Ser. No. 775,349

Int. Cl.[2] B05B *1/30*

U.S. Cl. 239—533.11 **1 Claim**



1. A fuel injection valve assembly comprising:

an elongated housing defining a chamber therein;

inlet means for communicating said chamber with a source of fuel;

outlet means at one end of said housing defining an orifice for communicating said chamber with a combustion chamber;

an elongated valve element reciprocably mounted within said chamber and operative to control communication of said chamber with said outlet orifice;

spring mounting means mounted in the end of said housing remote from said outlet and including guide means for one end of said valve member;

said spring mounting means including self-aligning means mounting said spring mounting means within said one end of said housing, wherein said self-aligning means comprise a spherical bearing surface formed on said spring mounting means cooperatively engaging a spherical surface formed in the end of said chamber, the housing defining said chamber being shaped so that the spherical bearing surface is retained within the spherical surface formed in the end of the chamber.

4,071,198

APPARATUS FOR GRANULATING MATERIAL

Merritt D. Tetreault, East Douglas, Mass., assignor to Amacoil Machinery, Inc., New Rochelle, N.Y.

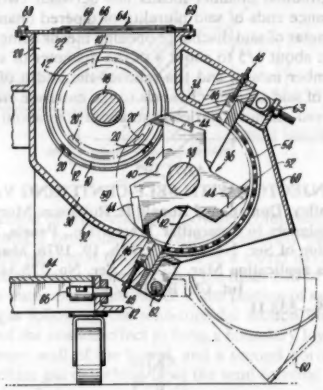
Filed May 12, 1976, Ser. No. 685,641

Int. Cl.[2] B02C *13/286*

U.S. Cl. 241—73 **5 Claims**

1. In an auger feed granulator, a cutting chamber having an inlet opening in one side wall, a feed hopper, a shaft extending

through said opening and supported at one end at said feed hopper and at its other end at the opposite wall of said cutting chamber, an auger mounted on a first portion of said shaft for feeding material from said hopper to said cutting chamber, said auger extending along a substantial length of said shaft, a second portion of said shaft, without said auger mounted thereon, being positioned within said cutting chamber, means for rotating said auger to move material from said feed hopper



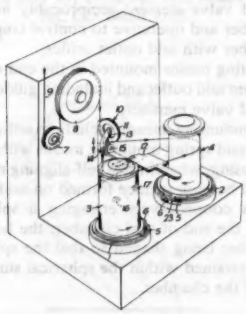
into said cutting chamber, and means for removing from the second portion of the shaft, sprues and runners of material extruded from the auger, said means comprising a rotatable knife assembly having a plurality of peripherally attached knives, mounted in said cutting chamber, the peripheral cutting path of the attached knives intersecting the auger envelope to remove sprues and runners from the second portion of the shaft.

4,071,199

APPARATUS FOR WINDING WIRE OR OTHER ELONGATE MATERIAL

Edward Owen Jones, Aughton, England, assignor to BICC Limited, London, England

Filed Nov. 15, 1976, Ser. No. 741,613
Int. Cl.² B65H *54/00*
U.S. Cl. 242—25 A **7 Claims**



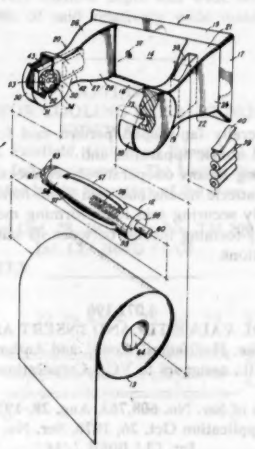
1. Wire-winding apparatus comprising: means for supporting a pair of reels in fixed positions; means comprising a respective torque motor for driving each said reel to rotate about its axis; means for guiding a wire to pass at least partially round a reel in one of said fixed positions and thence on to a reel in the other of said fixed positions; means for cutting a length of said wire extending between a pair of reels when supported in said positions; co-acting with said cutting means, means for engaging the said length of wire to cause it to be cut by said cutting means and for guiding a leading cut end of said wire to the said reel in the said first position; and means for adjusting the torque of each said motor.

4,071,200

ELECTRIC TOILET TISSUE DISPENSER

Barry N. Stone, 662 Rockbridge Road, NW., Lilburn, Ga. 30247

Filed June 25, 1976, Ser. No. 699,678
Int. Cl.² A47K *10/38*
U.S. Cl. 242—55.2 **9 Claims**



1. A toilet tissue dispensing assembly, comprising in combination:

a. a housing including a frame and a pair of mounting arms extending from said frame, a portion of one of said arms being hollow,

b. drive means including a motor, drive gear means within one of said arms and connected to said motor and switch means on said housing to selectively actuate said motor; and

c. a core rotatably mounted within said housing and in engagement with said drive gear means, said core being adapted to receive thereon a roll of toilet tissue whereby actuation of said switch means selectively rotates said roller to dispense an amount of tissue from said roll.

4,071,201

REEL FOR TICKET ROLLS

Harvey B. Austin, Jr., Berwyn, Pa., assignor to Globe Ticket Company, Horsham, Pa.

Filed Apr. 6, 1977, Ser. No. 785,024
Int. Cl.² B65H *19/00, 35/10*
U.S. Cl. 242—55.2 **13 Claims**

1. A reel for ticket rolls comprising:

a base,

said base being comprised of a thin plate bent into a wall supporting configuration in which said base includes

a first portion arranged in a plane for mounting against a flat surface on which the ticket roll is to be supported and

an angle shaped portion exending from said first portion,

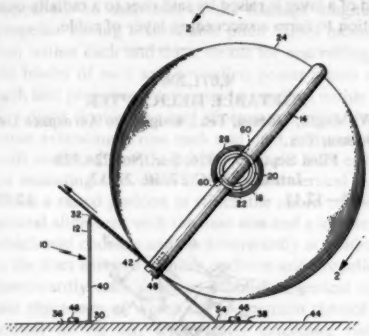
a pair of guide posts,

means mounting said pair of guide posts on said angle shaped portion of said base to extend therefrom in spaced parallel relationship, and

a hub mounted on said guide posts for supporting a ticket roll between said guide posts,

said hub including a pair of axially spaced hole means ar-

ranged so that said hub fits over said guide posts with said guide posts extending through said hole means,



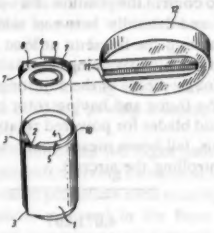
said hub being retained on said guide posts for slidable movement along the extent of said guide posts.

4,071,202

ROLL FILM CASSETTE

Josef Gersch, Unterhaching, and Otto Wiedemann, Starnberg, both of Germany, assignors to AGFA-Gevaert, AG, Leverkusen, Germany

Filed Mar. 9, 1977, Ser. No. 775,983
Claims priority, application Germany, Mar. 12, 1976, 7607694
Int. Cl.[2] G03B *1/04*
U.S. Cl. 242—71.1 **5 Claims**



1. A roll film cassette, comprising a casing having a tubular wall provided with an axially extending film slot and with an open axial end bounded by an axially projecting circumferential rib; and a cover for said open axial end, said cover being formed with a projection which enters into said film slot adjacent said open axial end and also being provided with a circumferentially extending recess into which said rib is adapted to enter so as to form with said cover a labyrinth-type light seal, said recess being in a circumferential direction interrupted at the location where the cover is formed with said projection.

4,071,203

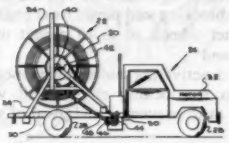
LAYING OF FLEXIBLE PIPE

Robert C. Sneed, and Joseph C. Young, both of Odessa, Tex., assignors to Fas-Line Sales and Rentals, Inc., Odessa, Tex.

Division of Ser. No. 591,540, June 30, 1975, Pat. No. 3,995,355.
This application July 12, 1976, Ser. No. 704,421
Int. Cl.[2] B65H *75/40*
U.S. Cl. 242—86.6 **1 Claim**

1. On a vehicle for temporarily laying and retrieving flexible pipe having

a. a truck frame,
b. ground engaging wheels supporting the frame,
c. a motor on the frame, and
d. truck drive means on the frame for driving the ground engaging wheels from the motor,
e. THE IMPROVEMENT COMPRISING:
f. a drive "A" support on one side of the frame,
g. a clutch "A" support on the other side of the frame,
h. an axle
  i. extending from the drive "A" support to the clutch "A" support, and
  ii. journaled to each "A" support,
j. a sprocket on the axle at the drive "A" support,
k. a shaft journaled to the truck frame,
m. reel drive means on the truck frame for rotating said shaft,
n. a sprocket on said shaft,
o. a chain connecting said sprockets,
p. a reel having a hub journaled on the axle between the "A" supports,
q. a clutch at the clutch "A" support interconnecting the axle and the reel,
r. a brake interconnecting the reel and one of the "A" supports,
s. flexible pipe coiled on said reel,



t. said reel drive means is a transmission interconnecting said motor and said shaft whereby the shaft is rotated at about 100 rpm,
u. the brake includes
  i. a tube welded on the clutch "A" support,
  ii. a rod through the tube,
  iii. a brake shoe on the rod adapted to ride on the rim of the reel,
  iv. a spring between the tube and the shoe, and
  v. lock means on the rod for pulling the shoe from the rim; and
v. the clutch includes
  i. a clover leaf cut-out on the reel hub,
  ii. a sleeve keyed to the axle at the clutch "A" support,
  iii. lugs on said sleeve so that in the engaged position the lugs mate with the clover leaf cut-out,
  iv. a groove in the sleeve,
  v. a fork in the groove, and
  vi. means interconnecting the fork and clutch "A" support for moving the fork and thus the sleeve so the notches may be moved into and out of engagement with the reel.

4,071,204

MULTIPLE LOCKING RETRACTOR

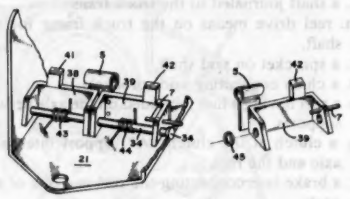
Frederick C. Booth, Birmingham, Mich., assignor to Allied Chemical Corporation, Morris Township, N.J.

Division of Ser. No. 485,392, June 28, 1974, Pat. No. 3,985,314, which is a continuation of Ser. No. 276,867, July 31, 1972, abandoned. This application July 27, 1976, Ser. No. 709,145
Int. Cl.[2] B65H *75/48*; A62B *35/02*
U.S. Cl. 242—107.4 B **14 Claims**

1. A safety belt retractor comprising:

a. a support;
b. a reel adapted for winding seat belt webbing thereon and journalled in said support on a axis for axial rotation in a wind direction and in the opposite unwind direction, said reel having two ratchet wheels connected thereto, each of said ratchet wheels provided with ratchet teeth;

c. a pawl bar associated with each ratchet wheel and biased for independent locking engagement with its associated ratchet wheel so as to lock said reel from rotation in the unwind direction, said pawl bars being longitudinally adjacent each other and rotatably positioned along a single axis which is substantially parallel to said axis of said reel, each of said pawl bars having a pawl, said pawl bars being positioned to provide independent locking action of said pawls such that when triggered one pawl is in full



locking engagement with a tooth on its associated ratchet wheel and the other pawl is not in full locking engagement with a tooth on its associated ratchet wheel;

d. means for blocking said pawls from engaging their associated ratchet wheels so as to permit unwinding of said webbing; and

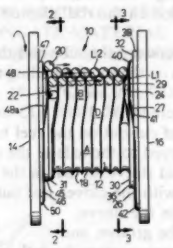
e. means for deactivating said blocking means and triggering said pawls for locking engagement with said ratchet wheels so as to prevent withdrawal of said webbing.

4,071,205

SPOOLING DRUM INCLUDING STEPPED FLANGES

John E. Wieschel, Hartland, Wis., assignor to Harnischfeger Corporation, West Milwaukee, Wis.

Filed Aug. 27, 1976, Ser. No. 718,116
Int. Cl.[2] B65H *75/14, 75/34*
U.S. Cl. 242—117 **3 Claims**



1. A rotatable spooling drum for spooling multiple layers of cable and comprising:

a cylindrical core having a longitudinal axis and opposite ends and for supporting said multiple layers of cable thereabout, each of said layers of cable including a plurality of winds of cable extending around and along the length of the core;

a pair of annular flanges secured to said opposite ends of said cylindrical core and extending radially outwardly from said cylindrical core, at least one of said flanges including a stepped inner face defining a plurality of ledges concentric to said cylindrical core and extending radially outwardly therefrom, each ledge adapted to support thereagainst an end wind of two of said layers of cable, each ledge having a thickness equal to half the diameter of said cable and the diametric distance between the circumferences of adjacent ledges being approximately equal to the radial thickness of at least two layers of cable, and a riser having a tapered ramp disposed along a portion of the circumference of each ledge and along the circumference of the end of said core nearest said one of said flanges, whereby as said cable is wound around said drum, an end wind of a layer is raised by said riser to a radially outward position to form a succeeding layer of cable.

4,071,206

PORTABLE HELICOPTER

Gilbert W. Magill, Odessa, Tex., assignor to Aerospace General Co., Odessa, Tex.

Filed Sept. 20, 1976, Ser. No. 724,528
Int. Cl.[2] B64C *27/50, 27/52*
U.S. Cl. 244—17.11 **12 Claims**

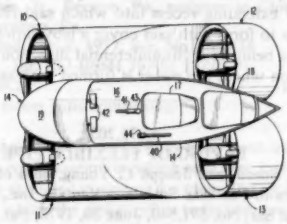
1. In a rotary wing aircraft, a substantially "A"-shaped frame having an upper vertex portion and a pair of downwardly diverging side bars, one each of which side bars is pivotally mounted to one of the free ends of the upper vertex portion, means for adjusting the upper vertex portion of the frame and the side bars to control the position of a vertical lift axis spaced forwardly of and laterally between said side bars, harness means for attaching the frame to at least one pilot of the aircraft, the vertical lift axis being adjustable to the individual trim of the pilot by means of the adjusting means, rotor means mounted by the frame and having rotor blades, rocket means mounted on said blades for powered rotation thereof about the vertical lift axis, tail boom means connected to the frame, and means for controlling the aircraft.

4,071,207

VERTICAL TAKE-OFF AIRCRAFT

Frank N. Piasecki, Haverford, and Donald N. Meyers, Philadelphia, both of Pa., assignors to Piasecki Aircraft Corporation, Philadelphia, Pa.

Filed Sept. 9, 1975, Ser. No. 611,739
Int. Cl.[2] B60V *1/11;* **B64C** *15/06*
U.S. Cl. 244—23 D **8 Claims**



1. A wingless vertical take-off and landing aircraft comprising a fuselage having a plurality of separate shrouded propeller ducts integrally mounted on each side thereof, each said duct being inclined downwardly at an acute angle to the longitudinal axis of the fuselage and having a propeller slipstream discharge exit to the atmosphere separate from that of each other duct, a portion of said plurality of ducts being located at the

forward end of the fuselage and a portion of said plurality of ducts at the rear end with an equal number of ducts located oppositely on each side of the fuselage longitudinal axis, a propeller having controllable pitch blades mounted for rotation within each said duct, means for controlling the pitch of the blades of each said propeller, power means connected to each said propeller rotating said propellers within their respective ducts establishing said slipstream, a plurality of deflector vanes extending across each said duct transversely of the aircraft rearwardly of the propellers in the duct exit area, means for mounting said vanes for pivotable vertical movement between a raised position in which the chord of each vane is in general alignment with the duct axis and a lowered position in which said chord is angled downwardly at a substantial angle to the duct axis in a manner to direct said propeller slipstream downwardly sufficiently to establish a vertical component of said slipstream of which the momentum thereof sustains the aircraft in the air, a vertically extending rudder surface mounted in the exit area of each said rear duct for pivotal movement about a vertical axis, control means actuatable from a pilot station comprising:

a. altitude control means for concurrently changing the blade pitch of all said propellers,

b. hover control means for setting the position of said vanes,

c. attitude control means comprising (1) aircraft pitching control means operable by a pitching control for differentially changing the pitch of the propellers in said forward and in said rear ducts upon actuation of said pitching control, (2) aircraft roll control means operable by a roll control for differentially changing the pitch of the propellers in said ducts on opposite sides of said aircraft upon actuation of said roll control, (3) aircraft yaw control means operable by a yaw control for controlling the position of said rudder surfaces upon actuation of said yaw control, and (4) means interconnecting said roll and yaw control means for moving said rudder surfaces as will establish a de-coupling yawing moment upon actuation of said roll control.

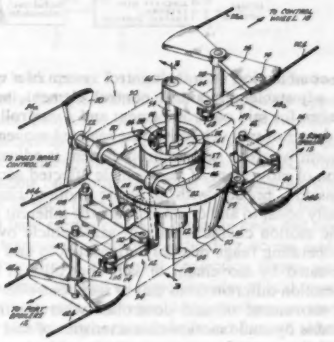
7. A method of controlling the flight path and attitude of a wingless VTOL aircraft deriving its vertical lift primarily from the thrust of shrouded propellers each rotating within a plurality of separate ducts mounted in the front and rear of the aircraft and in equal numbers on opposite sides of its centerline with the ducts aligned in a direction establishing an acute angle below the longitudinal axis of the aircraft and each duct having a separate propeller slipstream discharge exit to the atmosphere, said method comprising the steps of deflecting the slipstream from the shrouded propellers downwardly at such an angle as will establish the vertical and horizontal components of slip-stream momentum required to sustain the aircraft in flight at the desired forward velocity, changing the collective pitch of all propellers simultaneously in equal amounts to change altitude, changing the collective pitch of the propellers mounted forwardly of the aircraft center differentially from the propellers mounted rearwardly of the aircraft center to rotate the aircraft about its pitch axis, changing the collective pitch of the propellers mounted on the right side of the longitudinal centerline of the aircraft differentially from the propeller pitch on the left side of said longitudinal centerline to rotate the aircraft about its roll axis, deflecting the slipstream of the most rearwardly located propellers an amount transversely of the aircraft centerline to rotate the aircraft about its yaw axis, and upon applying said differential change in the collective pitch of the propellers on each side of the aircraft centerline to rotate the aircraft about its roll axis concurrently deflecting the slipstream of the most rearwardly located propellers transversely of the aircraft centerline in a direction and amount as will establish a de-coupling yawing moment about the aircraft yaw axis.

4,071,208

MECHANICAL MIXER FOR CONTROLLING AIRCRAFT SPOILERS

Thomas M. Baker, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sept. 13, 1976, Ser. No. 723,014
Int. Cl.[2] B64C 13/32
U.S. Cl. 244—83 G 10 Claims



1. In an aircraft including first and second aerodynamic control surfaces arranged and movably mounted on the port and starboard wings, respectively, of such aircraft to function as spoilers, and a mixer apparatus for positioning said control surfaces in response to the combined settings of first and second, independently variable, pilot-controlled inputs, wherein said first input is a speed-brake setting and wherein the second input is a roll setting derived from the control wheel of the aircraft, said mixer apparatus comprising:

cam means defining first and second three-dimensional cam surfaces;

support means upon which said cam means is movably mounted;

means for translating said cam means relative to said support means along a predetermined axis in response to said first pilot-controlled input;

means for selectively rotating said cam means relative to said support means about said axis in response to said second pilot-controlled input;

first and second cam follower means mounted and arranged for movement relative to said support means, said first and second cam follower means cooperating with said first and second cam surfaces, respectively;

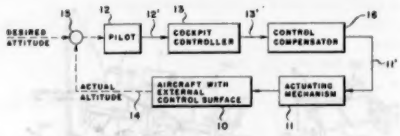
first and second coupling means coupling said first and second cam follower means to said first and second control surfaces, respectively; and

said first and second cam surfaces being so contoured that translation of said cam means along said axis in response to said first input, as determined by the speed-brake setting, varies the profiles of said cam surfaces that are followed by said cam follower means when said cam means is rotated in response to said second pilot-controlled input, as determined by said roll setting, in such a manner that causes a rate of roll of the aircraft in response to an increment of the roll setting to be substantially independent of the speed-brake setting.

4,071,209
VEHICLE CONTROL SYSTEM INCORPORATING A COMPENSATOR TO STABILIZE THE INHERENT DYNAMICS THEREOF

John Evans Hart, Atlanta, Ga., assignor to Lockheed Corporation, Burbank, Calif.

Filed Aug. 23, 1976, Ser. No. 716,831
Int. Cl.[2] B64C *13/04*
U.S. Cl. 244—83 D **10 Claims**

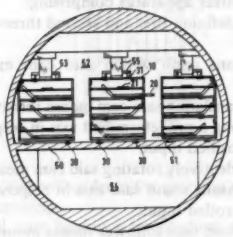


1. In combination with the control system of a vehicle having an adjustable directional control element, an actuating mechanism for said control element and a controller operable by the driver of said vehicle for the selected movement of said mechanism whereby said control element is adjusted and the direction of movement of said vehicle effected accordingly, a compensator, pre-set with dynamic motion characteristics essentially equal to and opposite from the inherent undesirable dynamic motion characteristics of said vehicle over a preselected operating range operably connected to said mechanism and actuated by movement of said controller at a predetermined motion different from that of said controller at all times during movement of said controller whereby the inherent undesirable dynamic motion characteristics of said vehicle are substantially negated.

4,071,210
ARRANGEMENT FOR THE TRANSPORTATION OF PERSONS IN A RECUMBENT POSITION IN PARTICULAR IN AIRCRAFT

H. Guido Mutke, Drygalski Allee 117, 8000 Munich 71, Germany

Filed Oct. 6, 1976, Ser. No. 729,993
Claims priority, application Germany, July 5, 1976, 2630210
Int. Cl.[2] A47C *19/20*; B61D *31/00*; B64D *11/00*
U.S. Cl. 244—118 P **10 Claims**



1. A unitized multiple passenger sleeping apparatus for expedited installation and removal in transportation bodies such as aircraft and the like and comprising:

a rack structure including the substantially integral combination of plural vertically spaced and longitudinally oriented rails, corner posts and cross rails, said longitudinal rails defining the lateral boundaries of said structure;

means extending between first laterally opposite pairs of longitudinal rails for sub-dividing said rack structure into a plurality of mutually exclusive, parallel, and vertically spaced passenger compartments;

a plurality of couches equal in number to the number of compartments and being individually disposed in said compartments immediately adjacent said sub-dividing means;

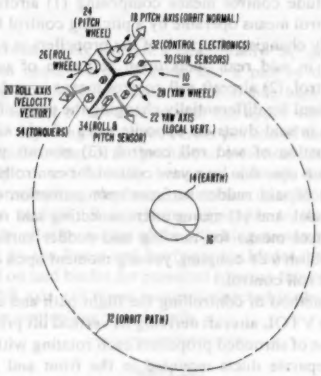
means displaceably supporting each of said couches between said first pairs of longitudinal rails whereby each couch may be at least partially displaced longitudinally out of the associated compartment;

and separate means disposed on the top and bottom of said rack structure for anchoring said structure within the interior of said transportation body, said means disposed on the bottom of said rack structure comprising guide rollers co-operable with suitable tracks mounted within the interior of said transportation body to permit rolling of said rack structure along an axis which is perpendicular to the longitudinal axis of said rack structure.

4,071,211
MOMENTUM BIASED ACTIVE THREE-AXIS SATELLITE ATTITUDE CONTROL SYSTEM

Ludwig Muhlfelder, Livingston; John Edward Keigler, Princeton, both of N.J., and Brian Stewart, Slough, England, assignors to RCA Corporation, New York, N.Y.

Filed Sept. 23, 1976, Ser. No. 724,577
Int. Cl.[2] B64G *1/20*
U.S. Cl. 244—165 **16 Claims**



1. An attitude control system for a satellite having a pitch, roll, and yaw axis, each axis, being mutually perpendicular to the other axes comprising:

a. three or more reaction wheels mounted on respective axes in fixed angular relation to said three perpendicular axes,

b. attitude sensing means for determining the angular deviation of the satellite from a predetermined reference attitude, said sensing means including a sensor for generating attitude error signals relative to the earth, said sensing means further including at least two sun sensors for generating attitude error signals relative to the sun,

c. means for providing data signals corresponding to orbit ephemeris,

d. means responsive to said sun attitude error signals and said ephemeris data signals for computing attitude errors of said yaw axis relative to the sun,

e. control means responsive to said earth attitude error signals and said sun attitude error signals for controlling the angular velocity of said wheels such that the respective attitude errors signals converge to zero,

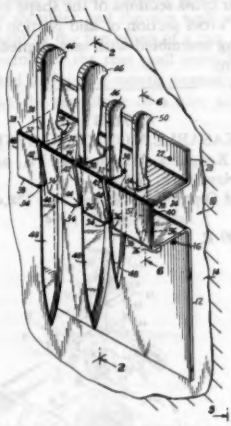
f. control means responsive to the angular velocity of each of said wheels for controlling the velocity of said wheels such that the long time-average momentum along said roll and yaw axes is essentially zero, and a residual momentum bias is generated along said pitch axis to provide gyroscopic stiffness to said satellite.

4,071,212

IMPLEMENT RACK

Thomas M. Burrows, Barrington, and Harold P. Ashton, Providence, both of R.I., assignors to Imperial Knife Associated Companies, Inc., Providence, R.I.

Filed Feb. 7, 1977, Ser. No. 766,060
Int. Cl.² A47G 21/14
U.S. Cl. 248—37.6 10 Claims



1. A rack for supporting an implement constituting an elongated work member having a handle at one end and having its weight so distributed that the center of gravity of the implement is below the handle, said rack comprising

a. a support,

b. an upper member having a front edge,

c. a lower member beneath the upper member and having a front edge,

d. means providing a slot in the upper member running rearwardly from an opening in the front edge of said upper member,

e. means providing a slot in the lower member running rearwardly from an opening in the front edge of said lower member,

f. said slots being substantially parallel in a vertical plane with one edge of the slot of (e) laterally spaced from said vertical plane, so that said one edge of the lower slot is vertically disaligned from the corresponding edge of the upper slot,

g. said top slot being narrower than the corresponding dimension of said handle when the implement is in said support,

h. means permitting moving of the work member rearwardly from the front of the rack and into the slots and toward said support to a retained position, said means permitting moving of the work member rearwardly being vertically disaligned with a vertical plane,

i. the opposite edge of the lower slot being less vertically disaligned from the corresponding edge of the upper slot whereby when an implement is introduced into said slots from the front of the rack by the means of (h) and released, the implement will pivot about the junction between the handle and the work member, so that the implement will swing to a retained position toward the opposite edge of the lower slot, and

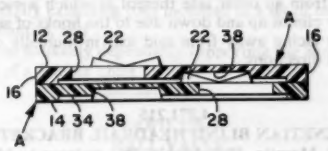
j. means blocking moving of the work member forwardly out of the slots when the implement is in its retained position whereby the implement cannot be moved forwardly from the support without previously aligning the work member with the first named set of edges of the two slots.

4,071,213

CLAMP BACK SPACER FOR CONDUIT

George R. Dauberger, Pittsburgh, Pa., assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Sept. 27, 1976, Ser. No. 726,773
Int. Cl.² F16L 3/10
U.S. Cl. 248—74 R 7 Claims



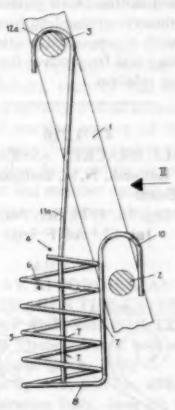
1. A clamp back spacer for rigid conduit or the like comprising; a generally flat base member having opposite upper and lower surfaces, projection means extending outwardly from said upper surface to define a cradle for cradling rigid conduit or the like, recess means in said lower surface for receiving said projection means on another identical base member when an identical pair of such base members are stacked on top of one another, said base member having opposite ends and opposite sides and a transverse centerline extending across said sides centrally between said ends, said projection means and said recess means being located on opposite sides of said transverse centerline so that a pair of identical base members are stackable by reversely positioning such members end-for-end relative to one another, and said projection means and recess means being shaped for preventing relative sliding movement in all directions between a stacked identical pair of said base members.

4,071,214

HOLDER FOR PAINT CANS AND THE LIKE

Robert A. Reidy, Lee Road, Somers, N.Y. 10589

Filed June 14, 1976, Ser. No. 695,823
Int. Cl.² E06C 7/14
U.S. Cl. 248—211 4 Claims



1. A holder for paint cans and the like, comprising in combination

a cage-like receptacle having an upright central axis;

first hook means comprising a U-shaped wire having a bight portion extending across the bottom of said receptacle, and two upright arms extending upwardly along opposite sides of said receptacle and having upper end portions shaped as two first hooks extending upwardly from said receptacle at diametrically opposite locations at the circumference of said recepta-

cle for suspending the same from a rung of a ladder and facing laterally away from one side of said axis; and

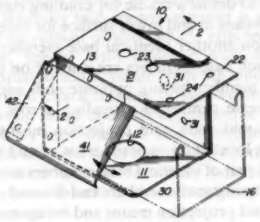
second hook means including a second hook facing laterally away from the opposite side of said axis at a location on said circumference which is intermediate said diametrically opposite locations, for connection with another rung of said ladder so as to stabilize said receptacle thereon, said receptacle being capable of being secured to the rungs of said ladder at an inner side of a ladder leg which faces away from an outer side thereof at which a user of the ladder climbs up and down due to the hooks of said hook means facing away from said axis in mutually opposite lateral directions.

4,071,215

VENETIAN BLIND HEADRAIL BRACKET

Anthony F. Marotto, Philadelphia, Pa., assignor to Marathon Manufacturing Company, Houston, Tex.

Filed Oct. 1, 1976, Ser. No. 728,607
Int. Cl.[2] B61L *11/08*
U.S. Cl. 248—251 **4 Claims**



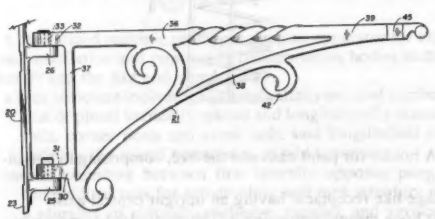
1. A venetian blind headrail bracket comprising a bottom wall for supporting a headrail, a side wall upstanding from said bottom wall, a rear wall upstanding from said bottom wall, a top wall spaced over said bottom wall extending between said side and rear walls, mounting means on at least one of said walls for mounting to a desired surface, an upstanding forward lip on the forward edge of said bottom wall for retaining a supported headrail on said bottom wall, against forward dislodgement from said bottom wall without deliberate raising over said lip, a front cover upstanding from said bottom wall in covering relation with a supported portion of a headrail, and pivot means mounting said front cover for swinging movement out of said covering relation.

4,071,216

WALL BRACKET ASSEMBLY

Ruediger Einhorn, Katonah, N.Y., assignor to Coats & Clarke, Inc., Stamford, Conn.

Filed Aug. 16, 1976, Ser. No. 714,471
Int. Cl.[2] A47F *5/00*
U.S. Cl. 248—290 **18 Claims**



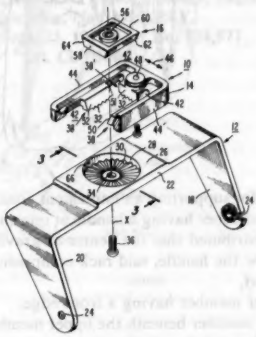
1. A wall bracket assembly comprising a wall plate and a bracket removably held therein, said wall plate comprising a base member having a wall mounting surface, first and second coaxial spaced apart pivot pins extending from said base member, said pins extending parallel to said surface with first ends affixed to said base member and second free ends, the free end of said first pin extending toward said second pin and the free end of said second pin extending away from said first pin, one of said pins being longer than the other of said pins, the longer of said pins having a portion thereof adjacent the first end of said longer pin with a non-circular cross section, said bracket having an article holding arm, and first and second spaced apart aligned projections, said projections having aligned holes with non-circular cross sections of the shape corresponding to the non-circular cross section of said portion of said one pin, said bracket being assembled with said aligned holes pivotally engaging said pins.

4,071,217

RELEASABLE MOUNTING SYSTEM

Robert Michael Kongelka, Washington, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Sept. 30, 1976, Ser. No. 728,427
Int. Cl.[2] B60R *1/04*
U.S. Cl. 248—309 R **7 Claims**



1. A mounting system for releasably securing an article to a support comprising:

a deformable first element for holding said article,

a deformable second element arranged to be secured to said support,

one of said first and second elements having an opening defined by deformable inner surfaces which deform with said one element, said one element includes tang means extending therefrom, and said other element includes wall means in engagement with said tang means,

a wedge member secured to the other of said elements for wedging the one element to the other element at said inner surfaces with said wedge member element wedging said tang means against said wall means,

said first element, in response to a sufficient force, disengaging said tang means from said wall means to permit enlargement of the opening by the wedging action of the wedge member and the latter to pass through the opening, whereby the two elements separate.

4,071,218

CAN MOUNTING CLIP

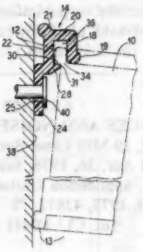
Richard D. Pecka, 1702 Harding Road, Northfield, Ill. 60093, and Raymond J. Templin, 2805 Henzada, McHenry, Ill. 60050

Filed Feb. 26, 1976, Ser. No. 661,429
Int. Cl.[2] A47K *1/08*
U.S. Cl. 248—221.4 **5 Claims**

1. A plastic clip for engaging the top chine of a can in hanging relationship when said clip is mounted to an upright support, said clip including

a rear wall,

a top wall,
a front wall spaced from the rear wall by said top wall and displaceable relative to the rear wall, but having memory of its nondisplaced position,
a capture space for the top chine of a can formed by the top, rear and front walls, said capture space having a dimension between the front and rear walls in nondisplaced condition which is substantially the same as the thickness of the top chine, and the capture space having a height between the shoulder and the top wall which is greater than the height of the top chine of a can,
a lip at the bottom of the rear wall extending toward the front wall and defining a mouth normally of smaller dimension than the top chine of a can, said lip having a



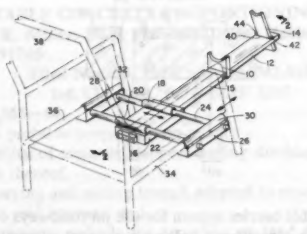
shoulder which lies in a plane parallel to the longitudinal axis of the top wall and a face boring in a plane normal to said top wall said shoulder supporting the bottom of a top chine positioned in the capture space, and said face of said shoulder abutting the continuous wall of a can, when positioned therein
a bracket extending from the rear wall,
the top and bottom of said rear wall having beads formed integrally therewith during the molding process, said beads spacing the rear wall from the upright support so a bottom chine of a can contacts the upright support, and
means for mounting the bracket to the front of an upright support such that the top chine clears the lip and is within the capture space, whereupon the memory returns the front wall to its nondisplaced position.

4,071,219

FISHING ROD SUPPORT DEVICE

Reuben Seager, Myerstown, Pa., assignor to Raymond Lee Organization, New York, N.Y.

Filed Dec. 30, 1976, Ser. No. 755,472
Int. Cl.[2] A47C 7/62
U.S. Cl. 248—534 **5 Claims**



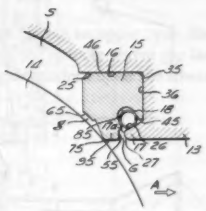
1. A fishing rod support device, comprising:
an extension,
a reel support member slidingly attached to the extension,
a rod support member passing through and pivotally supported on a distal end of the extension,
the extension slidingly received in a proximal larger member,
said larger member slidingly received in another member, whereby the largest member may move forward and backward in the other member,
the other member depending from a pair of cylindrical supports laterally slidingly supported on a pair of laterally extending rods,
the laterally extending rods mounted to a set of bars at their extremities, and
means of hookably dependably supporting the bars from the seat of a folding chair.

4,071,220

BALL VALVE

Tsuyoshi Iino, Nirasaki, Japan, assignor to Kitazawa Shoji Kabushiki Kaisha, Japan

Filed May 7, 1976, Ser. No. 684,311
Claims priority, application Japan, Sept. 25, 1975, 50-115882
Int. Cl.[2] F16K 5/20
U.S. Cl. 251—174 **15 Claims**



1. A ball valve comprising an outer casing which consists of a plurality of parts and accommodates therein a movable valve body having a flow path therethrough, a valve operating shaft journaled in said outer casing and arranged to rotate said movable valve body, and annular seal members interposed between said movable valve body and said outer casing and serving as valve seats for said movable body, each of said seal members including an annular groove extending so as to surround said flow path through said movable body, each of said annular grooves forming an annular flexible edge which is urged against a spherical surface of said movable valve body, and an annular expansive resilient member associated with each of said seal members, each of said annular expansive resilient members being spirally wound around itself and forcibly engaged into said annular groove of its associated seal member to exert a pressure through said annular flexible edge upon said movable valve body while urging an outer end surface of its associated seal member against an annular bottom wall of an annular casing groove provided in said outer casing.

4,071,221

ISOLATION VALVE AFFORDING AN ABSOLUTE TIGHTNESS TOWARDS THE EXTERIOR AND BETWEEN THE SEAT AND THE SHUTTING MEMBER

Nicola Di Sciascio, and Michele Vinci, both of Bari, Italy, assignors to Nuovo Pignone S.p.A., Italy

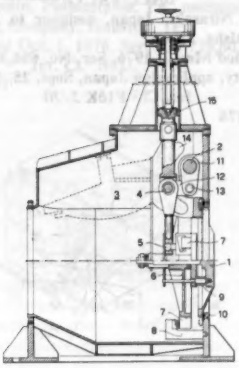
Filed June 9, 1976, Ser. No. 694,355
Claims priority, application Italy, June 10, 1975, 24190/75
Int. Cl.[2] F16K 31/44
U.S. Cl. 251—228 **3 Claims**

1. A gate adapted particularly for sealing off large cross sections, comprising
a housing having a valve seat and wedge members spaced about said seat,
a valve disk having a shaft operatively connected to said housing which pivotally connects said disk to said housing between the open and closed positions about an axis of rotation parallel to the plane of said disk,

said disk includes a pressure wheel on the side of said disk facing away from said seat,

said pressure wheel being adapted to rotate about on axis of rotation which is perpendicular to the plane of said disk, and including radially projecting spokes which engage said wedge members after said disk is moved to its closed position against said seat and said wheel is rotated in one direction to produce a pressing force for a tight valve seal, and which disengage from said members when said wheel is rotated in the opposite direction before said disk is moved to its open position away from said seat, and

a device which, by translational motion, rotates said disk between its open and closed positions in one plane and rotates said pressure wheel between its engagement and disengagement positions in a perpendicular plane, wherein said drive includes



an arc shaped guideway connected to said housing,

a rod movably positioned within said guideway,

a ram connected to said rod which itself moves in a translational direction and which moves said rod within said guideway,

a first pin connected to said rod and the outer end of one of said projecting spokes of said wheel for engaging and disengaging said spokes with said wedge members without rotation of said disk when said ram moves said rod in a portion of said guideway,

a link connected at one end to said rod,

a second pin connected at the other end of said link, and

an arm connected to said second pin and said disk, wherein through, said link, second pin and arm, said ram moves said rod in another portion of said guideway to open and close said disk without rotation of said wheel.

4,071,222

LIFTING PLATFORM

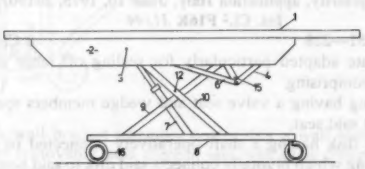
Howard Stanley Wright, 436 Devon St. West, New Plymouth, New Zealand

Filed Oct. 22, 1976, Ser. No. 734,889

Claims priority, application New Zealand, Oct. 24, 1975, 179054

Int. Cl.² B66F *7/08*

U.S. Cl. 254—8 C **12 Claims**



1. A lifting platform comprising:

a platform;

a base;

a pair of X-linkages supporting said platform above said base, a lower end of a first arm of each of said X-linkages being pivoted to said basethe lower end of the second arm of each of said X-linkages being slidably mounted to said base, the upper end of said second arm being pivoted to said platform;

a pair of swinging links, each having a first end pivotally connected to the upper end of a respective one of said first arms;

a pair of further links, each having a first end pivotally connected to the upper end of said second arm and a second end pivotally connected to a respective one of said swinging links at a point remote from said first end of said swinging link; and

means linking the second ends of said swinging links to said platform, whereby said platform is movable away from said base and said platform remains parallel to a fixed plane during the movement.

4,071,223

FENCES AND NOISE BARRIERS

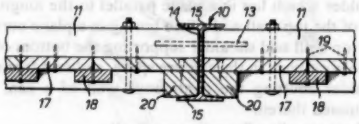
Vincent Demarest, 19 Mill Lane, Benson, Oxfordshire, England

Filed Apr. 26, 1976, Ser. No. 680,482

Claims priority, application United Kingdom, Apr. 26, 1975, 17409/75; Oct. 18, 1975, 42873/75

Int. Cl.² E04H *17/00*

U.S. Cl. 256—1 **9 Claims**



1. A barrier including a number of spaced upright posts, with inter-connecting horizontal rails and vertical boards, in which each of the upright posts is an integral rolled steel member of I-section providing grooves in opposite faces directed along the length of the fence, and the ends of the horizontal rails and the edges of adjacent boards, together with further vertical packing elements, are tightly fitted into the said grooves.

4,071,224

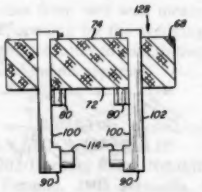
TRAFFIC SAFETY CONTROL MODULE SYSTEM

Herbert Allan Gilbert, 278 McKinley Road, Beaver Falls, Pa. 15010

Filed June 21, 1976, Ser. No. 697,767

Int. Cl.² E01F *13/00*

U.S. Cl. 256—64 **16 Claims**



1. A portable barrier system for use on roadways or the like comprising: a plurality of hollow elongated support modules formed of a resinlike material; at least one hollow elongated rail module formed of a resinlike material; first retaining means on one side of said support modules which are selectively cooperable with second retaining means on the other side of said support modules to releasably and captively retain adja-

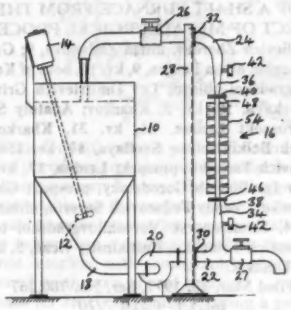
cent support modules when said support modules are stacked one upon the other; said support modules including third retaining means adjacent one end portion thereof axially spaced from said first and second retaining means and selectively cooperable with a respective axial end portion of said rail module to releasably and captively retain said one end portion of said rail module; and said rail module including fourth retaining means on one side thereof which are selectively cooperable with said first retaining means to releasably and captively retain said rail module with respect to said support module.

4,071,225

APPARATUS AND PROCESSES FOR THE TREATMENT OF MATERIALS BY ULTRASONIC LONGITUDINAL PRESSURE OSCILLATIONS

Richard A. Holl, St. Catharines, Canada, assignor to Holl Research Corporation, Mission Viejo, Calif.

Filed Mar. 4, 1976, Ser. No. 664,008
Int. Cl.[2] B01F *13/00*
U.S. Cl. 366—114 **24 Claims**



1. Apparatus for the treatment of material by the application thereto of ultrasonic longitudinal pressure oscillations comprising:

an enclosure having an inlet thereto and an outlet therefrom for material to be treated therein, the enclosure having two opposite closely-spaced walls at least one of which is an oscillation-applying wall, the spacing between the inner surfaces of the said walls being between about 0.1 mm and 25 mm;

at least one ultrasonic transducer mounted on the said oscillating-applying wall to apply longitudinal pressure oscillations to material contained within the enclosure interior;

and means for feeding material through the enclosure interior from said inlet to said outlet.

4,071,226

PORTABLE CONCRETE PROPORTIONING MIXER

Charles R. Miller, 2020 Placentia Drive, Hacienda Heights, Calif. 91745

Filed Nov. 16, 1976, Ser. No. 742,515
Int. Cl.[2] B28C *5/34;* **B01F** *7/08*
U.S. Cl. 366—64 **14 Claims**

1. In a portable proportioning mixer,

a plurality of separate hoppers having discharges at lower ends thereof,

a conveying and mixing trough adapted to receive materials from said hoppers, and

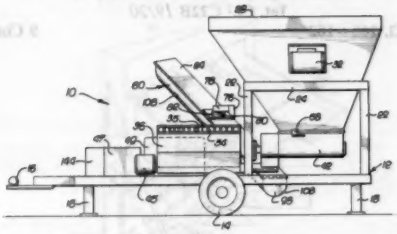
a transporting vehicle for traveling on land and having a frame supporting said hoppers and mixing trough,

the improvement comprising:

said mixing trough being adapted to be carried on said frame in a non-receiving position during transportation,

said mixing trough being pivotally mounted on said vehicle frame to be rotated from said non-receiving position to a receiving position to receive materials from said hoppers, said hoppers having lower ends at different levels relative to the trough in the receiving position,

said mixing trough having a lower end thereof under said hopper discharges in said receiving position,



said mixing trough being generally closed, having a plurality of receiving openings complementary to said hopper discharges in respective register therewith in said receiving position,

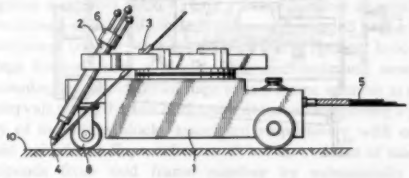
said mixing trough having an upper open discharge end, and the lowest level of the vehicle above the land during transportation being dependent upon the lowest hopper lower end.

4,071,227

SMALL MOVABLE HOT DESEAMER

Bridget M. A. McDonald, Nassau, Bahamas, assignor to I. P. U. Limited, Nassau, Bahamas

Filed Nov. 13, 1975, Ser. No. 631,477
Claims priority, application Germany, Nov. 14, 1974, 2453989
Int. Cl.[2] B23K *7/06*
U.S. Cl. 266—51 **5 Claims**



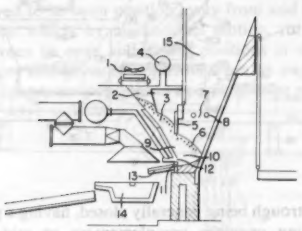
1. A small movable hot deseamer for selective deseaming of defective portions of a workpiece, said hot deseamer comprising a carriage, drive means and wheels rotatably mounted on said carriage for movement of said carriage along said workpiece in a first direction, a nozzle means mounted to said carriage, arms mounted to said carriage and selectively pivotal to a position in which said arms engage said workpiece and lift said carriage therefrom, said arms being mounted to said carriage to pivot about an axis parallel with said first direction whereby upon pivoting of said arms into engagement with said workpiece said deseamer is picked up from said workpiece and moved laterally in a second direction, said second direction being perpendicular to said first direction.

4,071,228

METHOD OF RECOVERING VALUABLE METALS FROM ZINC BEARING MATERIALS AND BLAST FURNACE RELEVANT THERETO

Hiroshi Tokunaga, Tokyo; Yoshikazu Tatehana, and Akira Umekawa, both of Ohmuta, all of Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan

Filed Aug. 2, 1976, Ser. No. 710,465
Int. Cl.[2] C22B *19/20*
U.S. Cl. 266—162 9 Claims



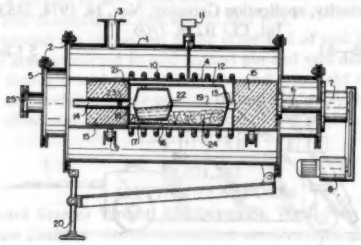
1. A blast furnace for recovering valuable metals from zinc-bearing material, which comprises a V-shaped hearth, tuyeres disposed along said hearth, a tap hole for discharging matte and/or slag, said tap hole being disposed substantially at the lowest point of the hearth, and damper means disposed above said hearth and said tuyeres to provide a space through which the zinc-bearing material can flow into a reaction zone above said hearth, said damper means defining a substantially V-shaped lower edge which is substantially parallel to and vertically upwardly spaced from said hearth and said tuyeres.

4,071,229

VACUUM REVOLVING CYLINDRICAL FURNACE

Hans-Günter Domazer, Essen-Stadtwald, and Horst Eggert, Essen-West, both of Germany, assignors to Th. Goldschmidt AG, Germany

Filed Mar. 25, 1977, Ser. No. 781,106
Claims priority, application Germany, Apr. 10, 1976, 2615767
Int. Cl.[2] C21B *11/06*
U.S. Cl. 266—173 8 Claims



1. A vacuum rotatable tubular furnace for metallothermal reactions comprising

an outer housing adapted to be evacuated and having on one end thereof a closable filler cap, and a vacuum-tight passage for a shaft on the other end,

rotatable tube means in said outer housing, said tube means being open on an end thereof facing said filler cap, and having a shaft connected to the other end of said tube and extending through said housing,

a cylindrical reaction chamber mounted in said rotatable tube means symmetrically to the longitudinal axis of the latter, and being detachably connected thereto, said reaction chamber being narrowed on a filling end thereof to a tube having a small lumen and being closed at the other end thereof,

a cylindrical evaporation chamber mounted in the area of the filling end of the reaction chamber and being adapted to contain metal effecting a metallothermal reaction, said evaporation chamber having an opening on an end thereof facing said filler cap,

heating means on said rotatable tube means at least within the area of the cylindrical reaction chamber,

means for evacuating the rotatable furnace,

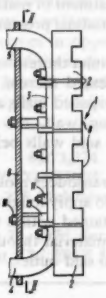
and drive means for rotating said rotatable tube means.

4,071,230

CONTRIVANCE FOR THE PROTECTION OF THE WALLS OF A SHAFT FURNACE FROM THE HEAT EFFECT OF METALLURGICAL PROCESS

Anatoly Vasilievich Zherdev, ulitsa Zhdanova, 9; Grigory Savvich Yakimenko, ulitsa Lenina, 9, kv. 16, both of Kommunarsk Voroshilovgradskoi oblasti; Lev Dmitrievich Gritsuk, ulitsa Kombainovskaya, 13, kv. 3, Kharkov; Anatoly Stepanovicy Gorbik, prospekt Lenina, 24, kv. 31, Kharkov; Evgeny Grigorievich Belkin, ulitsa Svetlaya, 19, kv. 156, Kharkov; Jury Ivanovich Tseluiko, prospekt Lenina, 17, kv. 55, Kharkov; Yakov Izrailievich Gorodetsky, prospekt Gagarina, 25, kv. 32, Kharkov; Vasily Fedorovich Severin, ulitsa Chapaeva, 168v, kv. 4, Kommunarsk Voroshilovgradskoi oblasti, and Alexei Ivanovich Tolochko, Pushkinsky viezd, 5, kv. 7, Kharkov, all of U.S.S.R.

Filed Mar. 23, 1977, Ser. No. 780,267
Int. Cl.[2] C21B *7/10*
U.S. Cl. 266—193 2 Claims



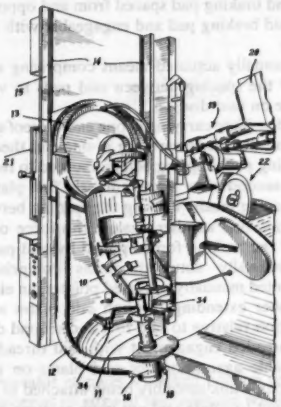
1. A contrivance for the protection of the walls of a shaft furnace from the heat effect of metallurgical process comprising blocks each whereof is more wider in the horizontal direction than long in the vertical one and which constitute all together a metal plate serving to shield the surface of walls facing the interior of the furnace and given a size which is two or three times longer in the vertical direction than wide in the horizontal one, at last two essentially U-shaped tubes for a coolant attached to the furnace wall with its open ends, grooves for said tubes provided in that surface of each of said blocks which faces the furnace wall, a layer of heat conductor provided in said grooves for said tubes, means of fastening each of said blocks to said tubes provided in the intervals between said grooves, fasteners welded to said tubes and holding down same to the furnace wall.

4,071,231

PNEUMOENCEPHALOGRAPHY CHAIR

Pieter Willem Kok, Trumbull, Conn., assignor to North American Philips Corporation, New York, N.Y.

Filed June 1, 1976, Ser. No. 691,289
Int. Cl.[2] A61G 13/00
U.S. Cl. 269—325 11 Claims



1. Apparatus for supporting a patient for tomography exposures during pneumoencephalography, comprising:

annular bearing means having a first bearing portion detachably mountable on the surface of a tiltable tomography table, said annular bearing having a central aperture sufficiently larger than a patient's head so that said bearing does not interfere with tomography of a patient's head positioned on the axis of said bearing;

chair means for receiving and supporting a patient substantially immobile within a space defined by an imaginary cone of predetermined size, the patient's head being toward the apex of said cone with the isocenter of the patient's head lying on the axis of said cone;

shaft means supporting said chair means for rotating a patient about the axis of said cone;

means for adjusting the position of said chair means along the axis of said cone for positioning the isocenter of the patient's head at a predetermined point along the axis of said cone; and

means entirely supported by a second bearing portion for supporting said shaft means in a position such that a central ray extends through the isocenter which is the intersection of the axis of rotation of the annular bearing which is perpendicular to the table, the axis of the cone, and the horizontal tomographic rotation axis of a rod-like parallelogram extending through the isocenter.

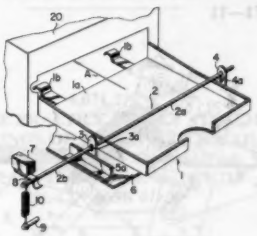
4,071,232

SHEET DETECTOR IN SHEET FEED STATION

Sakae Fujimoto, Chofu, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Sept. 27, 1976, Ser. No. 727,251
Claims priority, application Japan, Sept. 29, 1975, 50-117497
Int. Cl.[2] B65H 1/04, 7/04
U.S. Cl. 271—8 R 8 Claims

1. A sheet holding and detecting device adapted for use on a machine operating on sheet material for detecting the presence or absence of a sheet to be fed to a machine comprising a sheet supply means adapted to be mounted adjacent the sheet feeding end of such machine, said supply means being adapted to contain a supply of first sheets, a detecting means for supporting and detecting the presence or absence of a second sheet, means for mounting said detecting means relative to said sheet supply means so as to extend transversely of said supply means for movement between a second sheet presence position and a second sheet absence position, means for biasing said detecting means toward a second sheet absence position whereby the force exerted by said biasing means is equal to less than the gravity influence of one of said second sheets supported on said detecting means, means for limiting the move-



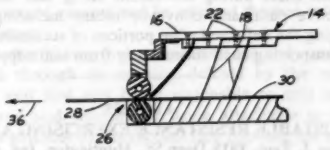
ment of said detecting means when subjected to the bias of said biasing means, and switch means disposed so as to be responsive to the movement of said detecting means to produce a signal when said detecting means is subjected to the weight of a second sheet so as to indicate the presence of a second sheet on said detecting means.

4,071,233

DOCUMENT HOLD-DOWN DEVICE

William David Morton, Jr., Mountain View, Calif., assignor to Bourns, Inc., Riverside, Calif.

Filed Dec. 6, 1976, Ser. No. 748,088
Int. Cl.[2] B65H 5/36
U.S. Cl. 271—8 R 2 Claims



1. In a device for holding a generally flat moving document against a support deck, having a frame member adapted to be positioned above a document plane and oriented to the axis of document travel with a plurality of stiffly resilient hold-down flaps formed from a plastic film, and including means for mounting said hold-down flaps to said frame member at spaced intervals along the axis of document travel comprising a plurality of mounting blocks associated respectively with each of said hold-down flaps, wherein all but an end one of said flaps depends from said frame member by substantially equal lengths, and said end one of said hold-down flaps is longer than the other flaps, the improvement wherein:

said frame member and mounting blocks include mutually aligned screw holes and said mounting blocks are attached to said frame member by screws extending thereinto through said frame member;

a pair of mounting blocks are associated with each of said hold-down flaps, the blocks of each pair having mutually opposed parallel guide surfaces to guide their associated hold-down flap therebetween; and

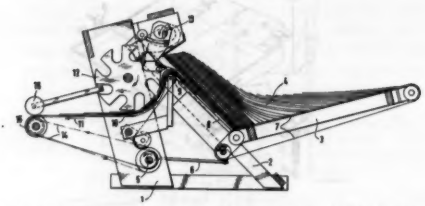
said mounting blocks are being arranged with two end blocks and at least one intermediate block, each of said intermediate blocks including guide surfaces along opposite sides cooperating with immediately adjacent blocks to guide a pair of flaps, one at each side.

4,071,234

HIGH PERFORMANCE SHEET-FEEDER MECHANISM

Gunther Schick, Bielefeld, Germany, assignor to Grapha-Holding AG, Hergiswil, Switzerland

Filed July 12, 1976, Ser. No. 704,499
Claims priority, application Germany, July 12, 1975, 2531262
Int. Cl.[2] B65H *3/08, 3/40*
U.S. Cl. 271—11 **6 Claims**



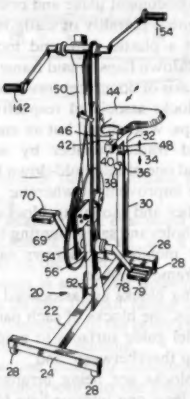
1. A sheet feeder apparatus, comprising receiver means for holding a supply of overlapping flexible sheets which include a foremost sheet having an edge portion that is exposed at one side thereof and a plurality of next-following sheets each having an edge portion which faces the edge portion of the preceding sheet; a plurality of staggered suction-operated sheet withdrawing devices; means for moving successive devices along discrete paths having sections extending along said edge portions of the foremost and next-following sheets of said supply so that a preceding device engages and deflects said edge portion of the foremost sheet away from the edge portion of the immediately following sheet and the oncoming device engages and deflects the thus exposed edge portion of the immediately following sheet, said moving means including discrete supports for said devices and means for articulately coupling said devices to the respective supports so that each device can lie substantially flush against the edge portion of the adjacent sheet during movement along said section of the respective path; and conveyor means including means for engaging the deflected edge portions of successive sheets and for transporting such sheets away from said supply.

4,071,235

ADJUSTABLE RESISTANCE EXERCISING APPARATUS

Lawson J. Zent, 1818 Dean St., Huntington, Ind. 46750

Filed Feb. 2, 1976, Ser. No. 654,609
Int. Cl.[2] A63B *21/22, 23/04, 69/16*
U.S. Cl. 272—73 **4 Claims**



1. A user actuated exercising apparatus comprising:
means for rotatably supporting a disc;
a braking pad mounted to frictionally engage said disc and provide a braking force to said disc;
manually actuated means for varying the magnitude of said braking force by said pad on said disc;
user operated means for providing rotation of said disc against said variable braking force,
said braking pad being engageable with a first disc side at the disc periphery;
a second braking pad spaced from and oppositely supported to said braking pad and engageable with said second disc side;
said manually actuated means comprising spaced means to vary the spacing between said pads to vary the braking force on said disc;
a first disc plate carrying at one end thereof said braking pad;
a second disc plate carrying at one end thereof said second braking pad; a spring being mounted to resiliently support said second plate relative to said first plate;
said spacing means varying the spacing between said plates relative one another against the force of said spring to vary the braking force applied by said pads to said disc,
said manually actuated means comprises a rotatably mounted manually operated pointer, an elongate threaded member extending through said plates and held against rotation relative to said first and second disc plates; a nut in threaded engagement with said threaded member and operable against one of said plates on rotation relative thereto; a link assembly being attached to said pointer and said nut to rotate said nut upon rotation of said pointer to thereby vary the braking force on said disc.

4,071,236

SWIMMER'S DRAG SUIT

George Oprean, 26 Chili Ave., Scottsville, N.Y. 14546

Filed Apr. 5, 1976, Ser. No. 673,377
Int. Cl.[2] A63B *69/00*
U.S. Cl. 272—116 **7 Claims**

1. A drag suit for a swimmer training for competition, the suit covering the swimmer's torso only, the suit having as an integral part thereof at least one drag creating pocket on both its front and back sides, the front and back pockets having substantially the same construction, each pocket being secured to the drag suit at its bottom and side edges only and including means for normally holding an upper edge of the pocket away from the suit whereby the pocket operates as a scoop when the swimmer moves through the water.

4,071,237

APPARATUS FOR EXERCISING MANUAL COORDINATION

Harold B. Hoogasian, 318 - 26th Ave., San Francisco, Calif. 94121

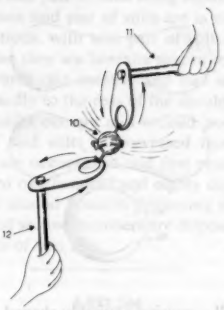
Filed Mar. 22, 1976, Ser. No. 669,342
Int. Cl.[2] A63F *9/00*
U.S. Cl. 273—1 R **5 Claims**

1. Apparatus for exercising manual coordination including in combination:
a ball having projections along each of three mutually perpendicular axes on each side of said ball, each projection extending out radially from said ball and then having a hooked portion making a slightly acute nearly right angle with the radial portion, and
a pair of ball manipulating devices, one to be held in each

hand at right angles to each other, each said device comprising

a handle, and

a flexible member rotatably secured adjacent one end to one end of said handle and extending at a right angle to the axis of said handle, said flexible member including an opening distant from said one end, said opening being larger in width and in length than the hooked portions of said projections,



whereby an operator engages a hooked portion with a said flexible member at an edge of said opening while rotating with one hand said flexible member of one said device in a first plane, and rotates the flexible member of the other said device with the other hand in a second plane normal to said first plane and seeks to engage a hooked portion and transfer it from one flexible member to the other and then back again, and so on.

4,071,238

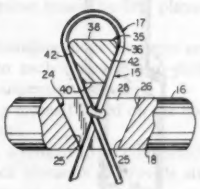
BASKETBALL GOAL ASSEMBLY

James C. Chapman, P.O. Box 559, Chester, Calif. 96020

Filed May 2, 1977, Ser. No. 792,516

Int. Cl.[2] A63B *63/00*

U.S. Cl. 273—1.5 R **10 Claims**



1. A basketball goal for supporting a depending goal net having a plurality of cord loop portions, comprising:

a. a goal ring having an upper surface and a lower surface,

b. said goal ring having a plurality of spaced apart slots extending peripherally around said ring and between said surfaces so as to receive a respective one of the cord loops therein,

c. each said slot including a pair of side walls angularly displaced relative to each other outwardly from said lower surface towards said upper surface so as to provide an enlarged open end,

d. a plurality of locking members dimensioned to simultaneously extend into each one of said slots, each said locking member comprising a body element having oppositely disposed top and bottom ends and spaced apart edges intermediate said ends, said edges being inclined relative to each other, and

e. said inclined edges of said body element being disposed in wedging relationship with the cord loop portions which are interposed between said inclined edges and said side walls so that upon the application of external forces to the goal net said locking members positively retain the goal net secured to said ring by means of the loops.

4,071,239

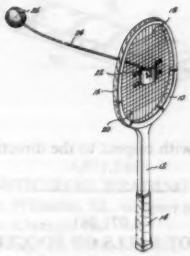
DEMOUNTABLE PRACTICE DEVICE ATTACHABLE TO THE STRINGS OF A STRINGED RACQUET

Thomas W. Ferguson, 801 S. 75th, Tacoma, Wash. 98408

Filed Apr. 19, 1976, Ser. No. 678,218

Int. Cl.[2] A63B *61/00*

U.S. Cl. 273—29 A **23 Claims**



1. A demountable practice device attachable to a conventional stringed racquet for practicing swings by striking a tethered ball, comprising:

a flexural anchor means having edge means configured to contact portions of the racquet strings on both string faces of the stringed racquet and be retained thereon solely by such contact;

an elastic tether having first and second ends, and sized to be received through an opening defined by the racquet strings, said first end being attachable to said anchor means and said second end being attachable to a ball which is strikable by the racquet face opposite the anchor means so that when said anchor means is positioned on said racquet strings, said first end is inserted through an opening defined by said racquet strings and attached to said anchor means, said second end is attached to said ball and said ball is struck by said racquet the tensioning caused by the struck ball at the outermost extent of ball travel generates potential energies in both the racquet strings and said anchor means to cause said ball to be returned towards said racquet face.

4,071,240

LIFTS FOR BALL ELEVATOR

Thomas M. Camilleri, 277 Avenue W., Brooklyn, N.Y. 11226

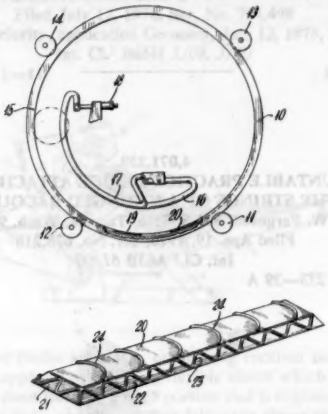
Filed Dec. 22, 1975, Ser. No. 642,913

Int. Cl.[2] A63D *5/02*

U.S. Cl. 273—49 **8 Claims**

4. In a ball elevator wheel for an automatic pinsetting machine the improvement comprising at least one substantially rectangular strip of flexible elastomeric material adhered to the inner circumference of the wheel, the strip covering only a

minor portion of the inner circumference of the ball elevator wheel, the strip being provided with a plurality of projections



which are concave with respect to the direction of rotation of the wheel.

4,071,241

LARGE FOOT BALLS OR SOCCER BALLS

Jose de Jesus Cortes Garcia, Arqueologos No. 57, Col. El Retono, Mexico City, Mexico

Continuation-in-part of Ser. No. 504,045, Sept. 9, 1974, abandoned. This application Nov. 13, 1975, Ser. No. 631,647
Claims priority, application Mexico, Sept. 10, 1973, 146062
Int. Cl.[2] A63B *43/02*
U.S. Cl. 273—55 B **1 Claim**

1. A soccer training device, comprising:

a. a soccer ball;

b. harpoon means piercing said soccer ball and secured thereto, said harpoon means having a neck portion passing through the soccer ball, a protruberance at one end of the neck portion inside the soccer ball and a swivel at the other end of the neck portion outside the soccer ball;

c. an elongated belt adapted to be worn around the waist of a player and an elongated tube longitudinally extending along and attached to the belt, the openings of the tube facing toward the front of the player when the belt is worn by the player;

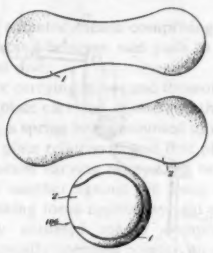
d. cord means passing through said tube and attached at one end to the swivel and at the other end to a handle, said cord means being operable to be manually moved through the tube by means of said handle, whereby the distance between the soccer ball and the player is under the continual control of the player during use.

4,071,242

ELECTRICALLY CONDUCTIVE TENNIS BALL

Lyle David Supran, 18A Blackheath Rise, London S E 13, England

Continuation-in-part of Ser. No. 238,888, March 28, 1972, abandoned. This application Apr. 15, 1974, Ser. No. 460,805
Claims priority, application United Kingdom, Mar. 30, 1971, 8176/71
Int. Cl.[2] A63B *61/00*
U.S. Cl. 273—61 R **11 Claims**



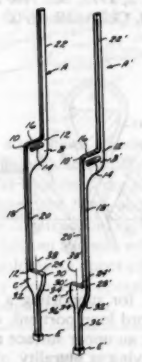
1. A tennis ball comprising suitably shaped panels of electrically conductive cloth bonded to a substantially spherical flexible core by means of a suitable adhesive and the application of heat, said cloth including electrically conductive material substantially uniformly distributed through said cloth from the outer surface of said flexible core to the outer surface of said ball.

4,071,243

STILT STRUCTURE

Lee Fink, 16591 Peale Lane, Huntington Beach, Calif. 92649

Filed June 30, 1976, Ser. No. 701,285
Int. Cl.[2] A63B *25/00*
U.S. Cl. 272—70.1 **8 Claims**



1. A pair of stilts that permit the user thereof to walk over a ground surface on said stilts, with said stilts being in either a first or a second position, with each of said stilts including:

a. an elongate handle that has a horizontally positionable upper edge and first and second portions;

b. a first elongate member having a second end secured to said handle, said member being vertically disposed when said upper edge is horizontally positioned, with said first elongate member having a longitudinally extending side and a first end;

c. a second elongate member that extends outwardly from said second end portion and is upwardly disposed when said upper edge is horizontally positioned;

d. A step secured to said first end of said first member, said

step defining an elongate edge surface on which a foot of a user may rest, said edge surface being disposed perpendicular relative to said longitudinal side of said first member and to said handle; and

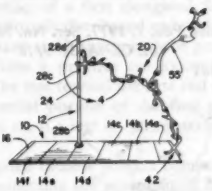
e. a third elongate member that extends outwardly from said step and is substantially centered relative to said edge surface, with said third member being downwardly positioned when said upper edge of said handle is horizontally positioned and said second member is vertically positioned, with said pair of stilts being capable of supporting said user when said pair of stilts are in either the first or second positions, with said pair of stilts being in a first position when they are laterally spaced to have said steps project towards one another and said second members extend upwardly to the rear of the shoulders of said user, and which stilts occupy said second position when the positions of said stilts are reversed from that position which they are occupied in said first position when each stilt is rotated one hundred and eighty degrees, with said steps in said second position projecting towards one another and said second members are disposed forwardly of the shoulders of said user.

4,071,244

SUSPENSION GAME

Marvin David Richards, 1109 E. Date, Brea, Calif. 92621

Filed Apr. 21, 1977, Ser. No. 789,572
Int. Cl.² A63F *3/00*
U.S. Cl. 273—275 **14 Claims**



1. A suspension game comprising:

at least one game board having playing zones indicated thereon;

a plurality of building block elements arranged to be interconnected to each other and to said board to form a bridge-like suspension structure;

interconnecting means formed on the ends of said building-block elements;

a ballast block arranged to be connected to any one of said building-block elements to provide structural support to said suspension structure; and

a height-metering means to be located on said game board to indicate height of said suspension structure during game play.

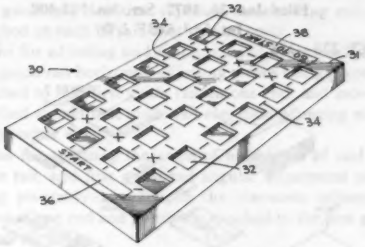
4,071,245

BOARD GAME

Robert H. Kendrick, 5007 W. 67th Terrace, Shawnee Mission, Kans. 66208

Filed Feb. 14, 1977, Ser. No. 768,188
Int. Cl.² A63F *3/00*
U.S. Cl. 273—243 GA **10 Claims**

1. A game comprising a plurality of generally cubical game pieces each having at least three different indicia on separate surfaces thereof, a three-dimensional game board having a playing surface and a plurality of recesses on the playing surface, each recess adapted to receive a game piece such that at least one surface of the game piece is visible, said game board further including indicia thereon for indicating a path between adjacent recesses, a plurality of movement pieces each having an indicium thereon which corresponds to one of the indicia on



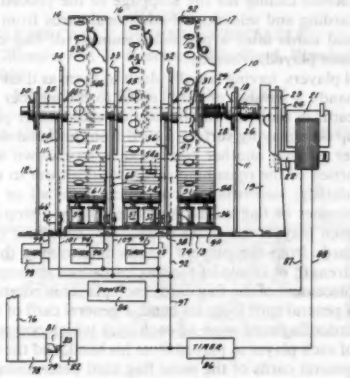
the game pieces, and chance means for determining movement of the movement pieces.

4,071,246

MAGNETIC REEL READING DEVICE

Donald E. Hooker, Wilmette, Ill., assignor to Bally Manufacturing Corporation, Chicago, Ill.

Filed Aug. 18, 1976, Ser. No. 715,525
Int. Cl.² A63F *5/04*
U.S. Cl. 273—143 R **7 Claims**

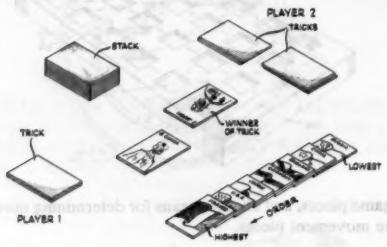


1. Means for detecting the position of a reel having a portion of magnetic material in an outer cylindrical rim portion with a first plurality of aligned openings formed in said magnetic material and circumferentially spaced about the rim portion, comprising, a first magnetic detector mounted adjacent said openings in said magnetic material such that an output pulse is produced each time an opening passes said detector, a counting means receiving the output of said first magnetic detector, an indexing opening formed in the magnetic material in said reel offset from said first plurality of openings, a second magnetic detector mounted adjacent said reel, an indexing pulse produced each time said indexing opening passes said second magnetic detector, the output of said second magnetic detector being connected to a reset terminal of said counting means, and said cylindrical rim being of magnetic material and said first plurality of openings and said indexing opening being formed in said rim.

4,071,247
CARD GAME

Jeffrey D. Breslow, Highland Park, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed Jan. 26, 1977, Ser. No. 762,408
Int. Cl.[2] A63F 1/00
U.S. Cl. 273—308 7 Claims



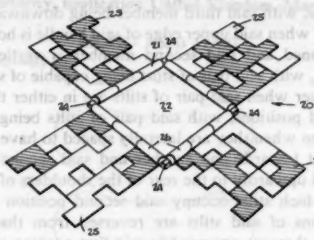
1. A playing card game for two or more players comprising:
a deck of playing cards, each card having playing indicia on a playing face and a non-playing decorative design on an opposite surface,
a plurality of flag cards, each with indicia on said playing face depicting the flag of a particular one of a plurality of different countries of the world,
a set of general cards for each flag card, each general card in each set having indicia on said playing face having a picture of a general officer of the armed forces of the respective country in uniform, plus a number thereon indicating the order of rank of each general in the set of general cards, and
at least one stop card having indicia on the playing face thereof calling for the stoppage of the procedure of discarding and selection of additional cards from a stack of said cards after a particular number of flag cards have been played, whereby,
said players, having initially dealt to them as their respective hands, a number of cards equal to the number of general cards in each set, and in rotation each player placing face up on a playing surface a card from his hand and thereafter picking another card from a face down stack comprised of the remaining cards not dealt out to the players initially, said rotation continuing until all or a selected number of flag cards as designated by a stop card have been played, the order of face up placement of said flag cards from the players' hands determining the order of strength or trump of the flag cards, and subsequent to the placement of the flag cards each player in rotation playing a general card from his hand, a general card of the highest order flag card winning each trick which comprises a card of each player as played from his hand, and the number on general cards of the same flag card determining the winner of a trick when two or more general cards of the highest order flag card remaining to be played are played in a trick, a winner of the card game requiring the winning of a selected number of tricks by a player.

4,071,248
PUZZLE APPARATUS

Carl E. High, 110 Sullivan St., New York, N.Y. 10012

Filed Nov. 8, 1976, Ser. No. 739,795
Int. Cl.[2] A63F 9/08
U.S. Cl. 273—155 10 Claims

1. Puzzle apparatus comprising a frame defining a substantially square base playing area, said frame including a plurality of axle members, one each axially disposed along a respective side of said area, a plurality of socket members joining adjacent ends of said axle members to define the corners of said area, a plurality of strip members each having a mounting hub at one end thereof pivotally attached at said hub to a respective one of said axle members in side-by-side relation to other strip members to provide a corresponding number of strips on each axle member, said strips being adapted to be interleaved with one another to cover said area in overlying relationship to provide a preselected solution sequence determined by a particular

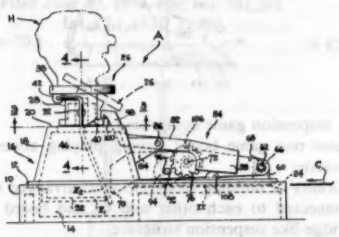


interleaved pattern, said hub of each strip member being adapted for relative pivotal and longitudinal movement of said strip members with respect to said axle members when said strip members are interleaved in said overlying relationship to permit said interleaved strip members to lie flat against one other in said overlying relationship.

4,071,249
DOLL HEAD HAVING TWO RANDOMLY SELECTED MOVEMENTS

Adolph E. Goldfarb, 4614 Monarca Drive, Tarzana, Calif. 91356, and Erwin Benkoe, 17965 Medley Drive, Encino, Calif. 91316

Filed Feb. 7, 1977, Ser. No. 765,928
Int. Cl.[2] A63F 9/18
U.S. Cl. 273—161 11 Claims



1. A random decision making device capable of providing a positive and a negative response on a random basis, said device comprising:
a. a support means capable of a first pivotal movement about a first generally transversely extending axis representative of a positive response and of a second pivotal movement about a second generally vertical axis representative of a negative response,
b. a doll's head carried by and being movable with said support means to signify the positive or negative response,
c. a separate actuating element used by a player of the device for operatively bearing against said support means at a point offset from said first axis and at a point offset from said second axis tending to bias said support means in both said first and second pivotal movements, but said support means tending to undergo only one of said movements in response to said bias if said support means is free to undergo either of said movements,
d. a latch intermittently engageable with said support means to permit said one of said movements when not engaging said support means and to permit only the other of said movements when engaging said support means,

e. rotatable camming means operatively associated with said latch and having portions thereon which bias said latch out of engagement with said support means when said camming means is rotated to certain positions and permit said latch to be operatively engaged with said support means when rotated to other positions to thereby control the selection of the first or second movements, and

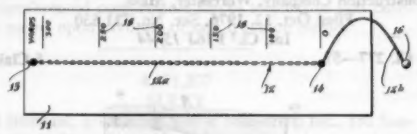
f. random selection means operatively associated with said camming means and being located to cause random rotation of said camming means through the action of said separate actuating element.

4,071,250

GOLF PRACTICE DRIVE ANALYZER

Ray L. Vroome, 43 Lawson Drive, Madison, Conn. 06443

Filed Mar. 24, 1976, Ser. No. 669,810
Int. Cl.[2] A63B *69/36*
U.S. Cl. 273—185 C **4 Claims**



1. A golf ball driving practice device comprising

a. a practice mat having a first end and an opposite second end so that the mat may be disposed in the direction of the intended flight of the practice golf ball that is disposed adjacent the opposite second end;

b. a tether consisting of a first elongated flexible portion composed of uniformly distributed material heavy enough to gradually retard and bring to rest the practice golf ball when driven from a practice tee located adjacent the second end of the mat toward the first end of the mat and enable a substantial portion of the first portion of the tether to repose on the mat on termination of the flight; and

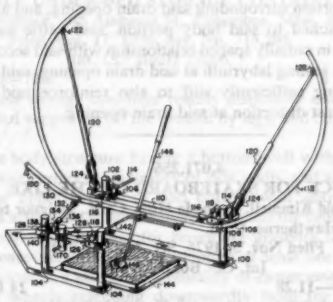
c. a second elongated flexible portion composed of a lightweight cord connecting the practice golf ball to one end of the first portion of the tether whereby the practice golf ball may be teed at a safe distance from the end of the first portion of the tether and driven into a brief substantially unrestricted flight pattern before being gradually retarded by said uniformly heavy first portion.

4,071,251

GOLF SWING TRAINING DEVICE

John Beckish, 228 W. Mitchell St., Milwaukee, Wis. 53204

Filed July 26, 1976, Ser. No. 708,992
Int. Cl.[2] A63B *69/36*
U.S. Cl. 273—186 R **8 Claims**



1. A golf Swing training device comprising:

a. a base having a first pair and second pair of posts mounted thereon;

b. a first arcuate guide rail;

c. means for adjusting the elevation of the first guide rail said first guide rail elevation adjusting means being movably attached to each of said first pair of posts;

d. means for adjusting said first guide rail horizontally, said first guide rail horizontal adjusting means being pivotably attached to said first guide rail on one end, and movably attached to said first guide rail elevation adjusting means on the other end;

e. means for adjusting the angle of inclination of said first guide rail, said first guide rail angular adjustment means being pivotably attached to the elevation adjustment means at one end and pivotably attached to the first guide rail on the other;

f. a second arcuate guide rail positioned in proximity with said first guide rail and adjusted to provide a passageway between the two rails, slightly larger than the diameter of the shaft of a golf club.

g. means for adjusting the elevation of said second guide rail, said second guide rail elevation adjusting means being movably attached to said second pair of posts;

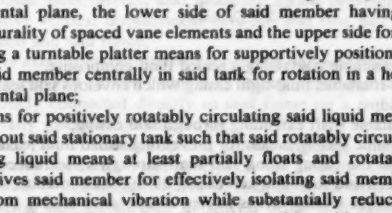
h. means for adjusting said second guide rail horizontally, said second guide rail horizontal adjustment means being pivotably attached to said second guide rail on one end and springingly attached to said second guide rail elevation adjusting means on the other end so that the second guide rail will swing away from the first guide rail in response to the impact of the shaft of a golf club.

4,071,252

FLUIDICALLY DRIVEN TURNTABLE

David M. Gillespie, 451 E. Fourteen Mile Road, Birmingham, Mich. 48009

Filed Sept. 8, 1976, Ser. No. 721,626
Int. Cl.[2] G11B *3/60*
U.S. Cl. 274—39 R **18 Claims**



18. A fluidically driven turntable assembly comprising:

a stationary tank;

a generally symmetrical member disposed at least partially within said tank for rotation therein in a generally horizontal plane, the lower side of said member having a plurality of spaced vane elements and the upper side forming a turntable platter means for supportively positioning said member centrally in said tank for rotation in a horizontal plane;

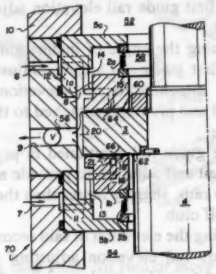
means for positively rotatably circulating said liquid means about said stationary tank such that said rotatably circulating liquid means at least partially floats and rotatably drives said member for effectively isolating said member from mechanical vibration while substantially reducing the effect of fluctuations in drive speed by said member and said rotating liquid means combining to achieve a flywheel effect.

4,071,253

GAS-SEALED SHAFT PACKING

Manfred Heinen, and Joachim Kotzur, both of Oberhausen, Germany, assignors to Gutehoffnungshutte Sterkrade A. G., Germany

Filed Mar. 11, 1977, Ser. No. 776,869
Claims priority, application Germany, Mar. 11, 1976, 2610045
Int. Cl.[2] F16J 15/40
U.S. Cl. 277—3 6 Claims



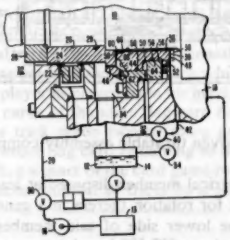
1. A gas-sealed shaft packing, comprising a rotary sealing ring adapted to be fixed to the shaft for rotation therewith, and having first and second movable ring seal surfaces on respective ends thereof, first and second fixed sealing rings having respective first and second fixed ring surfaces opposed to respective ones of said rotary sealing ring first and second ring seal surfaces and spaced away from said surfaces to define respective first and second sealing gaps therebetween, resilient means biasing said first and second fixed rings toward said rotary seal ring, separate first and second sealing gas feed conduits connected to each of said first and second fixed sealing rings and including a conduit portion extending through respective first and second fixed sealing rings and terminating in the respective first and second sealing gaps.

4,071,254

STATIC SEALING MECHANISM FOR A COMPRESSOR

Albert A. Raimondi; Howard N. Kaufman, both of Monroeville, Pa., and Norman J. Wood, San Jose, Calif., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 29, 1976, Ser. No. 736,803
Int. Cl.[2] F16J 15/34
U.S. Cl. 277—3 7 Claims



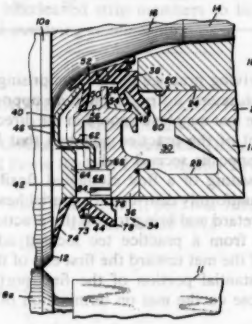
1. A machine containing a sealed fluid comprising:
a non-rotatable, fluid-tight casing which envelops said sealed fluid;
a rotatable shaft extending through said casing;
a dynamic sealing means for preventing sealed fluid leakage from the casing along said shaft through a clearance between said shaft and said casing during shaft rotation, said dynamic sealing means having an operative sealing capability which is selectively actuatable and is independent of shaft rotation;
a static sealing apparatus including an axially displaceable member which is selectively displaceable across said clearance into and out of contact with a seating member, said seating member being rotatable with and extending substantially radially from said shaft; and
controlling means for displacing said displaceable member by providing selected fluid pressures to a portion of the clearance, said portion being defined by said dynamic sealing means and said displaceable member, said pressures being selected to interact with an opposing force to move said displaceable member between positions where it is separated from and where it is in contact with said seating member, the fluid providing the separating pressure comprising said sealed fluid.

4,071,255

FLEXIBLE SEAL ELEMENT WITH REINFORCED DRAIN LABYRINTH

Lowell S. Salter, Jr., Shrewsbury, Mass., assignor to Morgan Construction Company, Worcester, Mass.

Filed Oct. 12, 1976, Ser. No. 731,630
Int. Cl.[2] F16J 15/44
U.S. Cl. 277—57 5 Claims



1. In a rolling mill wherein the neck of a roll is rotatably supported in a lubricated bearing contained in a bearing chock, with a seal assembly located between the roll end face and the bearing chock for retaining lubricant in the bearing while excluding contaminants such as cooling water, dirt and mill scale therefrom, the said seal assembly including a stationary outer seal ring spaced from the roll end face with a drainage port therein, the improvement comprising: a flexible seal element having a circular body portion adapted to tightly surround the outer seal ring, a circular first lip integral with and extending outwardly away from said body portion at an angle relative to the axis thereof, said lip being arranged to sealing contact the roll end face, a drain opening in said body portion arranged for alignment with said drainage port, a second lip on said body portion surrounding said drain opening, and a baffle member attached to said body portion, said baffle member cooperating in radially spaced relationship with said second lip to provide a sealing labyrinth at said drain opening, said baffle member being sufficiently stiff to also reinforce said body portion against distortion at said drain opening.

4,071,256

TRUCK FOR SKATEBOARD OR THE LIKE

Steven Donald Kimmell, Granada Hills, Calif., assignor to Mattel, Inc., Hawthorne, Calif.

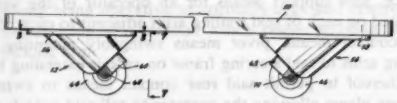
Filed Nov. 5, 1976, Ser. No. 739,079
Int. Cl.[2] B62B 11/00
U.S. Cl. 280—11.28 14 Claims

1. In a truck for use with a skateboard or the like, the combination comprising:

a generally cup-shaped housing having an open end and a bottom;

mounting means secured to said housing adjacent said open end, said mounting means extending in a plane transverse to the axis of said housing,

trunnion means rotatably secured to the bottom of said housing for rotation on said axis;



cushion means within said housing, said cushion means being circumferentially positioned about said axis; and

other means within said housing coupled for rotation with said trunnion means, said other means having portions thereof engaging said cushion means whereby to apply circumferential compressive forces to parts of said cushion means upon pivoting of said trunnion means.

4,071,257

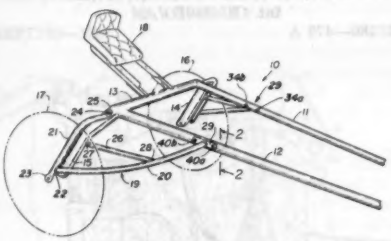
SULKY

Bernard Discount, c/o United Stellar Industries, Inc., 131 Sunnyside Blvd., Plainview, N.Y. 11803

Filed Sept. 30, 1976, Ser. No. 728,213

Int. Cl.² B62C *1/00*

U.S. Cl. 280—63 **7 Claims**



1. A sulky for carrying a rider behind a horse comprising a frame, a pair of wheels, a fork assembly for each wheel coupling the wheel to the frame, and a pair of substantially horizontal rails connected both to the frame and respective fork assemblies and adapted to embrace the flanks of the horse, the connection between the respective rails and fork assemblies including a frictionally loaded lost-motion coupling having means to stop the relative motion at predetermined distances to define the limits of the frictionally loaded lost motion.

4,071,258

MOBILE UNDER-BED STORAGE CONTAINER

Mabel D. Wallace, 605 Alabama St., Columbus, Miss. 39701

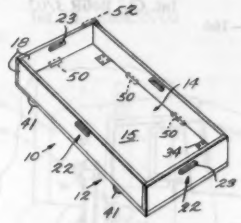
Filed Aug. 17, 1976, Ser. No. 715,205

Int. Cl.² B62D *53/06*

U.S. Cl. 280—79.2 **8 Claims**

1. A mobile storage container readily disposable under the frame of a bed supported off the ground by legs, said container comprising:

a box-like body structure having a bottom wall with upper and lower surfaces, a plurality of side walls, and an open top, the upper surface of said bottom wall adapted to support articles to be stored thereon; means for ventilating said body structure and for providing grasping thereof, said means including means defining at least one hand-hold cutout in a side wall; a plurality of caster assemblies having wheels extending downwardly from the lower surface of said bottom wall for supporting said body structure for rolling movement; means for mounting each of said caster assemblies in a recessed position with respect to said body bottom wall, and inwardly of the side walls of said body, including a metal plate member having one portion thereof substantially flush with the upper surface of said bottom wall, and having another vertically and longitudinally displaced portion thereof mounted on the lower surface of said body bottom wall; a flexible material



cover for said body structure to cover the open top thereof and to fit and extend over said side walls of said body structure; means defining at least one opening in said flexible cover corresponding to the hand-hold cutout in said at least one side wall of said body structure; and the height D of the container from the bottom of said caster assemblies to the top of said side walls being less than the height of the bed frame supported off the ground by legs.

4,071,259

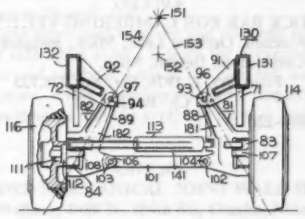
VEHICLE WHEEL SUSPENSION SYSTEM

David A. Ernest, Park Forest, Ill., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed May 27, 1976, Ser. No. 690,541

Int. Cl.² B60G *1/00*

U.S. Cl. 280—95 R **10 Claims**



1. A vehicle comprising:

a rigid longitudinally extending frame,

a first pair of laterally spaced ground engaging support wheels for said frame,

mounting means rotatably connecting said first pair of wheels to one longitudinal end of said frame at laterally opposite sides thereof, said mounting means preventing relative vertical displacement between said first pair of wheels and said frame,

a pair of axle structures disposed at laterally opposite sides of the other end of said frame and having upper portions pivotally connected directly to said frame on a pair of laterally spaced longitudinal axes,

a second pair of laterally spaced ground engaging wheels rotatably mounted, respectively, on the laterally outer portions of said axle structures for rotation about horizontal axes, said second pair of wheels being held against vertical displacement relative to said axle structures, and

a transversely extending link pivotally connected at its opposite ends to the laterally inner portions of said axle struc-

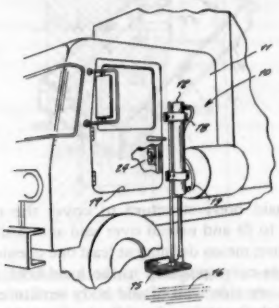
tures, respectively, on a pair of laterally spaced pivot centers disposed below said pair of longitudinal axes.

4,071,260

EASY CAB ENTRY AND EXIT

James A. Marshall, Sr., 106-17 Corona Ave., Corona, N.Y. 11368

Filed Oct. 5, 1976, Ser. No. 729,655
Int. Cl.[2] B60R 3/02
U.S. Cl. 280—166 2 Claims



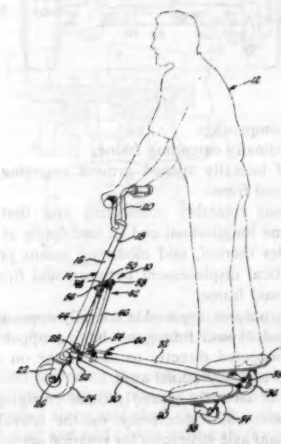
1. An easy cab entry and exit device comprising in combination, a cab for an automotive truck, and an accessory mounted outside said cab said accessory including a stationary cylinder, a vertically slidable piston inside said cylinder, a piston rod out of a lower end of said cylinder being affixed to a foot plate, power means for moving said piston including a pump driven by an electric motor in circuit with a battery of said truck and a switch unit inside said cab, wherein a rod parallel to said piston rod is affixed to said foot step, said rod being slidable in a pipe stationarily positioned alongside said cylinder.

4,071,261

LOCK BAR FOR CAMBERING VEHICLE

Frank J. Winchell, Orchard Lake, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 1, 1976, Ser. No. 728,723
Int. Cl.[2] B62K 5/02
U.S. Cl. 280—220 4 Claims



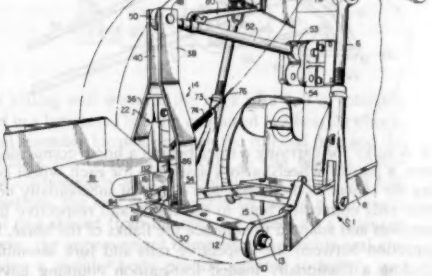
1. A three point contact cambering vehicle having a longitudinally extending roll axis comprising a steering frame, an elongated steering shaft mounted for turning movement in said steering frame, a steerable front contact means operatively connected to one end of said steering shaft for engagement with a support surface, a manual steering device operatively connected to the other end of said steering shaft, said steering frame further comprising a pair of elongated trailing arms extending rearwardly from said steering frame, laterally spaced rear contact means operatively connected to end portions of said trailing arms for engagement with the support surface, foot support means for an operator of the vehicle mounted on each of said trailing arms adjacent to each of said rear contact means, pivot means swingably mounting said trailing arms to said steering frame on an axis extending laterally thereof to permit said rear contact means to swing in separate planes allowing the operator to roll said vehicle with respect to said roll axis, a cambering device interconnecting said trailing arms so as to cause the latter to move through equal amounts in opposite directions so that the rear contact means camber by an amount equal to vehicle roll, and a lock bar pivotally connected adjacent one end thereof to one of said trailing arms and having a portion located adjacent the other end thereof that is normally maintained adjacent said one of said arms and is movable along an arc into engagement with the other of said trailing arms for preventing relative movement thereof.

4,071,262

TRAILER HITCH APPARATUS WITH LOCKING MEANS

Horace D. Griffin, Jr., 7704 Whaleyville Blvd., Suffolk, Va. 23438

Filed Dec. 13, 1976, Ser. No. 750,120
Int. Cl.[2] B60D 1/04
U.S. Cl. 280—479 A 7 Claims



1. A trailer hitch apparatus for connecting a trailer tongue to a tractor, comprising:

a hitch assembly coupled with said tractor;

said hitch assembly including a connecting pin adapted to fit into an aperture at the forward end of the trailer tongue;

power means connected with said hitch assembly;

said power means being operative to selectively lower said hitch assembly to position said connecting pin beneath the level of said trailer tongue;

said power means being operative to selectively raise said hitch assembly to position said connecting pin within said trailer tongue aperture;

said hitch assembly including a movable locking device having a locking arm;

said locking device being moved to a release position when said hitch assembly is lowered;

said locking device being moved to an operative position after said hitch assembly is raised; and

said locking arm being engaged against the top of said trailer tongue when said locking device is in its operative position to thus retain said trailer tongue coupled with said

hitch assembly while said connecting pin is disposed within said trailer tongue aperture;

said locking device including a biasing spring normally urging said locking arm to a position where it is axially aligned with and disposed above said connecting pin;

said locking device further including means pivotally mounting said locking arm, a lug projecting from said locking arm and coupled to a control rod, and said biasing spring being operative to normally urge said control rod and said lug to a position which resists pivoting of said locking arm.

4,071,263

COUPLING HOOK FOR A THREE-POINT CONNECTION ON A TRACTOR

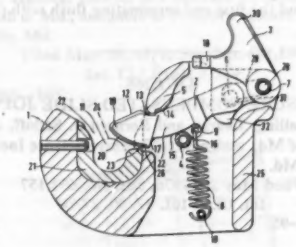
Dieter Kunze, Clarendon Hills, Ill., assignor to Jean Walterscheid GmbH, Lohmar, Rhineland, Germany

Filed Mar. 29, 1977, Ser. No. 782,569

Claims priority, application Germany, Apr. 17, 1976, 2617021

Int. Cl.[2] B60D *1/10*

U.S. Cl. 280—508 **5 Claims**



1. A coupling hook for a guide member of a three-point attachment of a tractor comprising a hook member having a hook opening to receive a coupling pin on an implement and the like, said hook member having a pocket therein and there being a passage between said pocket and said hook opening, there being a slot in said pocket and a pivot element slidably received within said slot, an operating lever pivotally mounted on said pivot element and said pivot element being slidable in said slot when said operating lever is pivoted to a predetermined angle, a latch pivotally connected to said operating lever and having one end extending through said passage towards said hook opening, means defining a guide surface within said pocket and said latch having a first supporting surface pivotable and slidable on said guide surface, said latch having a second supporting surface engageable with an edge of said passage and said one end of said latch having an unlocking surface and a locking surface such that a coupling pin acting upon said latch unlocking surface during the coupling operation will slide said latch upon said guide surface into said pocket and when a coupling pin is locked within said hook opening said coupling pin acts upon said latch locking surface to urge said latch second supporting surface against said passage edge to produce a moment acting upon said latch and operating lever urging said latch into said hook opening.

4,071,264

SKI AND METHOD OF MAKING SAME

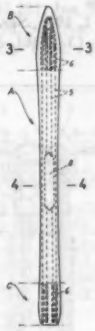
Maurice Francois Legrand, Voiron, and Gerard Cholat-Serpoud, Sillans, both of France, assignors to Skis Rossignol S.A. Club Rossignol S.A., Voiron, France

Filed June 18, 1976, Ser. No. 697,612

Claims priority, application France, June 20, 1975, 75 20180; Dec. 3, 1975, 75 37693; Dec. 3, 1975, 75 37695; Apr. 8, 1976, 76 11270

Int. Cl.[2] A63C *5/00*

U.S. Cl. 280—610 **12 Claims**



1. A ski comprising:

a protective upper plate;

a lower sliding plate spaced from said upper plate;

at least one layer of transversely spaced longitudinally extending steel reinforcing wires lying between said plates;

an elongated core of synthetic-resin material having front and rear regions, said core being disposed between said plates and surrounding said wires, said wires being in contact with and fixed to the synthetic resin of the core without play over the length of the ski except at front and rear regions thereof; and

elastic means interposed between said core and surrounding each of said wires at said regions for preventing contact between said synthetic resin of the core and said wires at said regions, while permitting relative displacement between said wires and the synthetic resin at said regions.

4,071,265

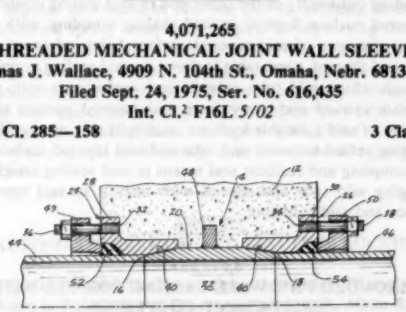
THREADED MECHANICAL JOINT WALL SLEEVE

Thomas J. Wallace, 4909 N. 104th St., Omaha, Nebr. 68134

Filed Sept. 24, 1975, Ser. No. 616,435

Int. Cl.[2] F16L *5/02*

U.S. Cl. 285—158 **3 Claims**



1. A threaded mechanical joint wall sleeve for use in a concrete wall member, comprising,

a cylindrical member having opposite ends and inside and outside surfaces, said cylindrical member being adapted to be substantially centrally positioned in said wall member,

a pair of end members threadably secured to the opposite ends of said cylindrical member and extending outwardly therefrom, said end members having flange portions at their outer end portions which are substantially flush with said wall member, said cylindrical member having a

length substantially less than the thickness of said wall member,

each of said end members adapted to receive a sealing O-ring therein which is adapted to sealably embrace a pipe member extending therethrough,

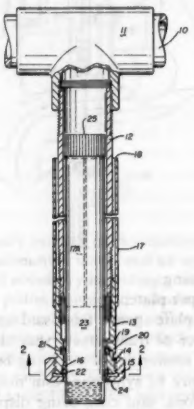
a retainer operatively secured to each of said flanges for maintaining said O-rings in said sealing relationship.

4,071,266

ADJUSTABLE DROP NIPPLE

George S. Mountford, Chippewa Lake, Ohio, assignor to A-T-O Inc., Willoughby, Ohio

Filed Nov. 1, 1976, Ser. No. 737,499
Int. Cl.[2] F16L *27/12*
U.S. Cl. 285—14 **10 Claims**



1. An adjustable drop nipple for a fire extinguishing sprinkler system to connect a sprinkler at the underside of a room ceiling with a nipple in water distributing piping above the room ceiling, said adjustable drop nipple comprising a sealing coupling having one end engaging said nipple, an elongated sleeve on the exterior of said sealing coupling extending toward said distributing piping and partially overlying said nipple, a tube telescopically arranged in said sealing coupling and nipple and extending outwardly of the other end of said sealing coupling, a tapered surface formed in said sealing coupling with the largest diameter of said tapered surface being adjacent said other end thereof, a rotatable lock nut on said sealing coupling through which said tube extends and enclosing a split ring movable toward and away from said tapered surface upon rotation of said rotatable lock nut, said split ring arranged for wedging action between said tube and said tapered surface of said coupling and resilient seal means in said sealing coupling engaging said tube and spaced with respect to said tapered surface and said split ring.

4,071,267

SHROUDED PIPE WALL CASTING FOR USE WITH SPLIT-CLAMP COUPLINGS

Samuel H. Davis, 111 Forest Drive, Jericho, N.Y. 11753

Filed Apr. 27, 1976, Ser. No. 680,740
Int. Cl.[2] F16L *3/00*
U.S. Cl. 285—64 **8 Claims**

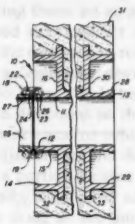
1. A pipe fitting adapted for use as a wall casting in a poured concrete wall having a predetermined thickness, the pipe fitting comprising:

a cylindrical pipe barrel having a first end and a second end, the first end being adapted to be connected to another pipe end by a split clamp type of coupling, and the length of the pipe barrel between the first and second ends being equal to the predetermined thickness of a poured concrete wall in which the fitting is intended to be installed,

an annular shroud surrounding the first end in radially spaced relation to the outer surface of the pipe barrel,

a circumferential continuous blank flange extending radially from the periphery of the shroud at a location spaced axially inward from said first end to serve as a water stop when the fitting is installed in a concrete wall;

a circumferential wall connecting the shroud to the pipe barrel at a location spaced from the first and second ends,



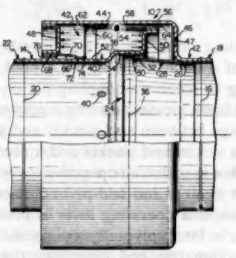
the shroud terminating at the circumferential wall so that at least a portion of the pipe barrel between the circumferential wall and the second end is unshrouded, and the shroud extending axially from the circumferential wall toward the first end to terminate in the plane of said first end to form with said circumferential wall an open well having sufficient space to provide access for mounting a split clamp coupling on said first end after the fitting has been installed on such a poured concrete wall with the shroud and the first end terminating flush with one side of the wall.

4,071,268

PRESSURE COMPENSATED SLIDE JOINT

Horace P. Halling, Laurel, and Bernard J. Sadoff, Jr., Rockville, both of Md., assignors to Pressure Science Incorporated, Beltsville, Md.

Filed May 28, 1976, Ser. No. 691,157
Int. Cl.[2] F16L *17/00, 27/04*
U.S. Cl. 285—95 **10 Claims**



1. A pressure compensated slide joint for sealing first and second tubes having high pressure fluid flowing therethrough, the combination comprising;

a metallic, resilient sealing element having a free diameter greater than the interior diameter of the second tube and extending from the first tube into an interference fit with the interior surface of the second tube sufficient to cause elastic deformation of the sealing element and thereby forming a fluid-tight seal therebetween;

means defining an annular chamber which is variable lengthwise in the axial direction, said means comprising

an annular outer wall coupled to the first tube and having

an inner diameter larger than the outer diameter of the second tube,

a first end wall extending inwardly from said outer wall to a position adjacent the second tube,

an annular inner wall formed by the outer surface of the second tube, and

a second end wall extending outwardly from the outer surface of the second tube to a position adjacent said outer wall;

first fluid-tight sealing means for sealing said first end wall and said inner wall during relative sliding movement thereof;

second fluid-tight sealing means for sealing said second end wall and said outer wall during relative sliding movement thereof;

said end walls having equal surface areas, each of which is equal to the cross-sectional area of the tubes, and

vent means in said second tube for venting the high pressure fluid therein into said chamber, said vent means being located between said end walls,

said first sealing means comprising a first metallic, resilient sealing member,

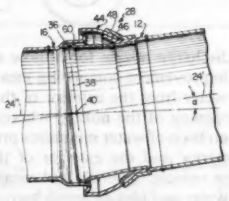
said second sealing means comprising a second metallic, resilient sealing member, coupled to said second end wall adjacent said outer wall and having a curved surface with a maximum free diameter greater than the interior diameter of said outer wall, said curved surface being in an interference fit with the interior surface of said outer wall sufficient to cause elastic deformation of said second sealing member.

4,071,269

FLEXIBLE PIPING JOINT

Horace P. Halling, Laurel, and Bernard J. Sadoff, Jr., Rockville, both of Md., assignors to Pressure Science Incorporated, Beltsville, Md.

Filed May 28, 1976, Ser. No. 691,159
Int. Cl.[2] F16L *27/04*
U.S. Cl. 285—165 **13 Claims**



1. A fluid-tight coupling and sealing apparatus for a first cylindrical tube and a second cylindrical tube having high pressure fluid flowing therethrough, the combination comprising:

a metallic, resilient annular sealing element extending from the first tube,

said sealing element having a ring portion having an outer surface with a maximum free diameter greater than the diameter of the interior cylindrical surface of the second tube and in contact via an interference fit with the interior cylindrical surface of the second tube sufficient to cause elastic deformation of said sealing element, thereby forming a fluid-tight seal therebetween; and

guiding means, coupled at least to the first tube, for maintaining the intersection point of the center lines of the tubes during angular misalignment thereof in the plane containing the line of contact of said annular sealing element and the interior cylindrical surface of the second tube;

said guiding means comprising a guide assembly formed of first and second arcuate ring members spaced apart to define an arcuate annular cavity therebetween, said first and second arcuate ring members being coupled to the first tube,

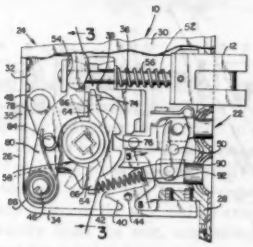
said guiding means further comprising a follower assembly coupled to the second tube and having an arcuate follower movable in said cavity, said follower having a thickness substantially equal to the thickness of said cavity.

4,071,270

MORTISE LOCK HAVING INTERNAL AUXILIARY SPRING FOR LEVER

Gordon A. Alexander, Newington, Conn., assignor to Emhart Industries, Inc., Farmington, Conn.

Continuation of Ser. No. 542,281, Jan. 20, 1975. This application Oct. 8, 1976, Ser. No. 730,948
Int. Cl.[2] F05C *1/16*
U.S. Cl. 292—169.22 **13 Claims**



1. In a mortise latch having a case including opposing side walls, a latch bolt supported in the case for movement between projected and retracted positions relative thereto, a latch bolt spring normally biasing the latch bolt to its projected position, inner and outer hubs supported in the case between the side walls and journalled for independent coaxial angular movement relative to said case and each other, a linkage for retracting the latch bolt in response to angular movement of either of the hubs, and a first spring acting between the linkage and the case for yieldably resisting angular movement of either and both of the hubs, the improvement comprising means in said case for limiting angular movement of at least one of said hubs in one direction relative to said case, said one hub having a radially extending arm, a second spring in said case engaging and acting between said arm and said case for yieldably resisting angular movement of said one hub in the other direction, said second spring comprising a spiral spring having one end secured in fixed position relative to said case and another end engaging said one hub and biasing it in said one direction, and a spacer having one portion disposed between said inner and outer hubs and another portion extending outward beyond said hubs and disposed adjacent said spiral spring, said other portion retaining said spiral spring in an associated side portion of said case.

4,071,271

AUTOMATIC RELEASE AND EJECTION LOCKING MECHANISM

Georges E. Bourrié, Neuilly sur Seine, and Robert Marc Lensel, Bourg la Reine, both of France, assignors to R. Alkan & Cie., Valenton, France

Filed July 26, 1976, Ser. No. 708,819
Claims priority, application France, July 29, 1975, 75 23624
Int. Cl.[2] E05C *19/16*
U.S. Cl. 292—201 **7 Claims**

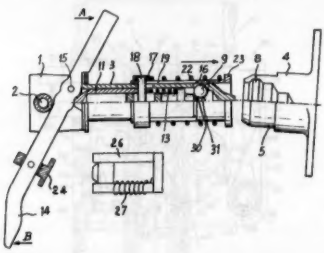
1. An automatic release and ejection mechanism, suitable particularly for the closure of safety equipment boxes on aircraft, comprising:

i. a fixed member for securing to a box, said fixed member defining a cylinder space, said fixed member having in its wall a plurality of radial openings,

ii. a latch member for securing to the closure of the box, said latch member having a recess adapted to receive a portion of said fixed member including said radial openings, said latching member having in its recess a radial groove which, when the latch member is fully engaged on the fixed member, is radially aligned with said plurality of openings,

iii. a set of balls disposed one in each of said radial openings

iv. a piston longitudinally slidable in the cylinder space of said fixed member, said piston having at its end adjacent said openings a first portion of a diameter which, when abutted by said balls, permits said balls to lie wholly within said fixed member, said piston having a second portion of a greater diameter which, when abutted by said balls, causes said balls to protrude from said fixed member into the radial groove of the latch member for locking the



latch member against withdrawal longitudinally off the fixed member

v. resilient loading means positioned to act between said latch member and said piston, said loading means being stressed by engagement of the latch member onto the fixed member, the force exerted by the loading means urging the piston in the direction to permit release of the balls from the groove of the latch member

vi. control means movably mounted on said fixed member and coupled to said piston, said control means having a first locking position of movement in which it prevents longitudinal movement of the piston by said loading means, said control means having a second releasing position of movement in which said piston is freed to be moved longitudinally by said loading means

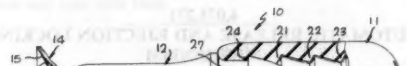
vii. means for retaining said control means releasably in said locking position.

4,071,272

CONTACT LENS APPLICATOR

Frank J. Drdlik, 6334 Bryn Mawr, Hollywood, Calif. 90028

Filed Sept. 27, 1976, Ser. No. 726,937
Int. Cl.[2] A61F 9/00
U.S. Cl. 294—1 CA **7 Claims**



1. A contact lens applicator for inserting and removing a contact lens in and from the eye of a user comprising the combination of:

a pliable bulb-like element having an internal cavity;

an elongated flexible shank having one end detachable connected to said bulb-like element;

a cup-like element integrally carried on the opposite end of said shank and exposing a compound concave curvature surface establishing a lens seat for carrying said contact lens;

said shank provided with an open-ended passageway in communication with said bulb-like element cavity and said lens seat for expelling air from said cavity when said bulb-like element is compressed;

said cup-like element is joined to said shank by a shank portion of reduced diameter whereby the flexibility of said shank is greater than the flexibility of the remainder of said shank;

said compound concave curvature comprises a pair of concave surfaces of different diameter coaxially disposed with respect to said shank passageway; and

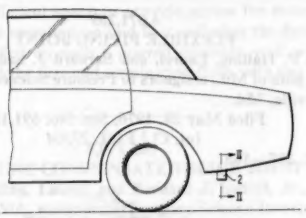
said bulb-like element includes a series of integrally formed reinforcement ribs projecting from the wall of said element into said cavity wherein said ribs strengthen said bulb-like element and bias the wall thereof to expand into its original shape.

4,071,273

WATER DISCHARGE, ESPECIALLY FOR HOLLOW SPACES IN MOTOR VEHICLE STRUCTURES

Albert Hack, Sindelfingen, and Heinz Faix, Boblingen, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Dec. 17, 1975, Ser. No. 641,435
Claims priority, application Germany, Dec. 20, 1974, 2460428
Int. Cl.[2] B62D 25/00
U.S. Cl. 296—28 R **9 Claims**



4. A water discharge nozzle for hollow spaces of vehicle structures, the improvement comprising means for preventing penetration of water from the exterior of the nozzle through the discharge opening of the nozzle, wherein said means for preventing penetration of water minimizes pressure differences between the interior and the exterior of the nozzle during operation of the vehicle, wherein said means for preventing penetration of water includes an apron surrounding the outlet end of said nozzle, said apron having a height dimension and an opening dimension which are multiples of the discharge opening dimension of the nozzle, and wherein the ratio of the apron opening dimension to the discharge opening dimension is of the order of 6 : 1.

4,071,274

PIVOTAL AND DETACHABLE TRUCK BODY SYSTEM

Thomas B. Dalton, Muskegon; Theodore Wayne Pyatt, Twin Lake, and Michael Jay Oosterhouse, Fremont, all of Mich., assignors to Westran Corporation, Muskegon, Mich.

Filed Feb. 23, 1976, Ser. No. 660,126
Int. Cl.[2] B60P 1/34, 1/64
U.S. Cl. 296—35 A **13 Claims**

5. A system for detachably securing a truck body onto the bed of a truck as said body is lowered onto said bed, said system comprising:

guide means secured to the bottom surface of said truck body,

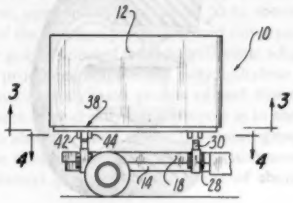
an adapter frame secured to said bed of said truck, and adapted to receive and guide said guide means as said truck body is lowered onto said truck bed,

means for locking said truck body onto said adapter frame when said truck body is in its lowermost position,

means for selectively unlocking said truck body from said adapter frame,

a hinge member laterally secured across the rear end of said adapter frame,

a bearing member secured to said truck body and abutting against said hinge member when said truck body is in its lowermost position,



said bearing member including an elongated semicylindrical abutment surface which abuts against said hinge member, and

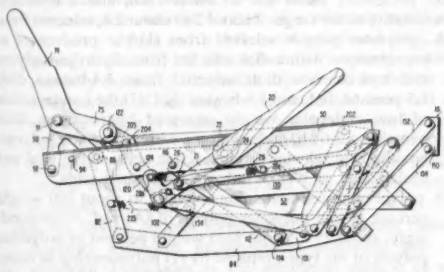
means for securing said bearing member to said hinge member comprising a downwardly extending hook member pivotally secured to said truck body at each axial end of said bearing member, said hook member operatively engaging around said hinge member as said truck body reaches it lowermost position.

4,071,275

RECLINER CHAIR WITH WALL AVOIDING ACTION

Walter Clark Rogers, Jr., Denton, N.C., assignor to Royal Development Company, Inc., High Point, N.C.

Filed Mar. 22, 1976, Ser. No. 669,270
Int. Cl.[2] A47C *1/02*
U.S. Cl. 297—85 **29 Claims**



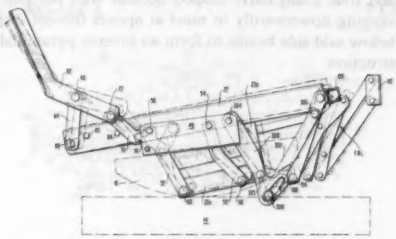
1. A wall-avoiding chair comprising in combination, a base, a seat, first linkage means mounting the seat relative to the base for movement between normal and reclining positions, a backrest, second linkage means mounting the backrest relative to the seat for movement relative to the seat between a generally upright position and a reclining position where the backrest extends at an incline relative to the seat, a footrest, third linkage means mounting the footrest for movement between a retracted position adjacent the seat and an extended position projected forwardly from the seat, a control handle connected to the third linkage means for moving the same between extended and retracted positions thereof, fourth linkage means connected between said first and third linkage means for moving the seat forwardly with wall-avoiding action relative to the base in response to movement of the footrest to extended position.

4,071,276

RECLINER CHAIRS

Nelson Lothair Cecil, Thomasville, N.C., assignor to Royal Development Company, Inc., High Point, N.C.

Filed Feb. 15, 1977, Ser. No. 768,742
Int. Cl.[2] A47C *1/02*
U.S. Cl. 297—85 **7 Claims**



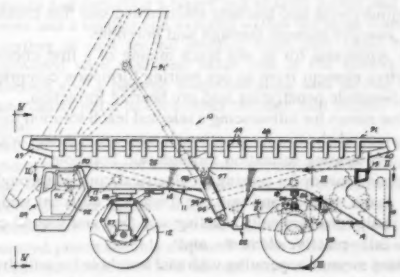
1. A reclining chair including a base, a seat, seat linkage mounting the seat for movement relative to the base, a backrest, backrest linkage mounting the backrest to and for movement relative to the seat between a generally upright position and a number of reclining positions, a footrest, footrest linkage mounting the footrest to the seat for movement between a retracted position adjacent the seat and an extended position projected forwardly from the seat, sequencing and control linkage connected between the footrest linkage and the seat for permitting the backrest and the seat to be moved to an initial reclining position relative to the base while the footrest is in retracted position but preventing further movement of the backrest to a reclining position advanced from said initial position unless the footrest is moved to extended position, and wherein said sequencing and control linkage includes a first control link pivoted relative to the seat, a second control link pivoted to the footrest linkage and a lost motion connecting means interconnecting said first and second control links, and wherein said lost motion connecting means includes a pin fixed to one of said control links and a slot on the other of said control links receiving said pin, the pin being movable in said slot, and wherein said first control link is also pivotally connected relative to said base, and wherein said footrest linkage includes a footrest mounting link pivotally mounted relative to the seat linkage and wherein said second control link is pivotally connected to said footrest mounting link.

4,071,277

FORWARD DUMPING TRUCK CONSTRUCTION

Robert N. Stedman, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 11, 1976, Ser. No. 665,733
Int. Cl.[2] B60P *1/16*
U.S. Cl. 298—22 P **30 Claims**



1. A truck comprising

a frame mounted on a plurality of roadwheels and including a pair of laterally spaced and parallel side beams,

an operator's cab mounted forwardly on said frame, a dump body comprising a pair of laterally spaced and parallel support rails each normally disposed on a respective one of said side beams when said dump body is horizontally disposed and maintained in a carry position on said frame and four triangularly shaped bottom wall portions converging downwardly to meet at apexes thereof disposed below said side beams to form an inverse pyramidal construction.

4,071,278

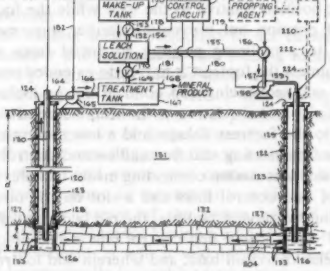
LEACHING METHODS AND APPARATUS

Neil L. Carpenter, Rte. 1, Box 246J2, Kerrville, Tex. 78028, and Clark Goodman, 95 Antiqua Court, Coronado, Calif. 92118

Filed Jan. 27, 1975, Ser. No. 544,413

Int. Cl.[2] E21B *43/27, 43/28;* E21C *37/18, 41/06*

U.S. Cl. 299—5 **27 Claims**



1. A process for removing in situ a first chemically reactive element from a generally insoluble gangue material in an ore bearing formation, comprising the steps of

drilling a borehole into said ore formation,

introducing a selected leaching solution containing a second chemically reactive element into said ore formation through said borehole,

passing an electric current through said leaching solution and said ore formation for chemically reacting said first and second chemically reactive elements which remain in solution in said leaching solution and

withdrawing said leaching solution and said first chemically reactive element through said borehole.

4. Apparatus for in situ leach mining of a first chemically reactive element from an ore bearing formation comprising

a borehole penetrating said ore bearing formation,

first means for introducing a selected leach solution having a second chemically reactive element into contact with said ore bearing formation through said borehole,

second means for passing an electrical current through said leach solution and said ore formation adjacent said borehole for chemically reacting said first and second chemically reactive elements, and

third means cooperating with said borehole for withdrawing said leach solution containing said first chemically reactive element.

4,071,279

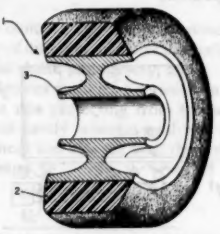
SOLID POLYURETHANE TIRE AND WHEEL ASSEMBLY

Daniel A. Chung, North Canton, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 21, 1975, Ser. No. 570,154

Int. Cl.[2] C08K *5/07, 5/10, 5/12*

U.S. Cl. 301—63 PW **6 Claims**



1. A substantially solid industrial polyurethane tire/wheel assembly is provided comprised of a solid polyurethane tire adhered to a centered rigid core adapted to fit to the axle of an industrial vehicle where said polyurethane is prepared by the method which comprises reacting (I) a complex of 4,4′-methylene dianiline and a salt selected from sodium chloride, sodium bromide, sodium iodide, sodium nitrile, lithium chloride, lithium bromide, lithium iodide, lithium nitrite and sodium cyanide, where the mole ratio of said dianiline to said salt is about 3/1, and where said complex is provided as a dispersion in a plasticizer selected from dioctyl phthalate, tetraethylene glycol di(2-ethylhexoate) and dibutoxy ethoxy ethyl formal, said dispersion containing about 50 to about 150 parts by weight plasticizer per 100 parts by weight complex, with (II) at least one prepolymer selected from the reaction product of a diisocyanate selected from 2,4- and 2,6-toluene diisocyanate, diphenyl methane-4,4′-diisocyanate, 3,3′-dimethyldiphenyl methane-4,4′-diisocyanate, 1,5-naphthylene diisocyanate and 3,3′-bitolylene-4,4′-diisocyanate with at least one polymeric polyol having a molecular weight in the range of about 800 to about 3200, preferably about 800 to about 2500, and a hydroxyl functionality in the range of about 2 to about 2.8, selected from

A. polyester polyols selected from (1) the product of ϵ-caprolactone with a diol selected from diethylene glycol and hydrocarbon diols selected from 1,4-butane diol, 1,5-pentane diol, and 1,6-hexane diol, (2) the condensation of low molecular weight saturated hydrocarbon diols containing 3 to 10 carbon atoms with an organic polycarboxylic acid selected from succinic acid, adipic acid and azelaic acid, as well as anhydrides of such acids,

B. polyol mixtures containing about 75 to about 100 weight percent of said polyester polyols of (A) and, correspondingly, about 25 to about zero weight percent of polyether polyols of the type prepared by (1) polymerizing or copolymerizing alkylene oxides selected from ethylene oxide, propylene oxide and butylene oxide, (2) polymerizing or copolymerizing low molecular weight glycols selected from ethylene glycol, 1,3-propane diol and 1,4-butane diol, (3) or by the reaction of one or more of said alkylene oxides with said glycols and, optionally, with the addition of a small amount of a triol such as trimethylol propane,

C. a polyol mixture containing about 25 to about 50 weight percent of said polyether polyols and, correspondingly, about 75 to about 50 weight percent of a polyester polyol selected from polyethylene adipate, polyethylene propylene adipate and polydiethylene adipate,

D. a polyol mixture comprising about 50 to about 100 weight percent of the polyester polyol of (A) and, correspondingly, about 50 to about 0 weight percent of a polyester polyol selected from polyethylene adipate, polyethylene propylene adipate and polydiethylene adipate,

E. about 75 to about 100 weight percent of the prepolymer

of (A) and correspondingly about 25 to about 0 weight percent of a prepolymer derived from the reaction of said diisocyanate and at least one of said polyether polyols,

F. about 50 to about 75 weight percent of the reaction product of said diisocyanate and at least one polyester polyol selected from polyethylene adipate, polyethylene propylene adipate and polydiethylene adipate, and, correspondingly, about 50 to about 25 weight percent of the reaction product of a diisocyanate and said polyether polyol, and

G. about 50 to about 100 weight percent of the prepolymer of (A) and, correspondingly, about 50 to about 0 weight percent of the reaction product of said diisocyanate and a polyester polyol selected from polyethylene adipate, polyethylene propylene adipate and polydiethylene adipate;

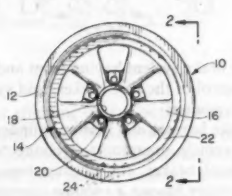
where the ratio of isocyanato groups of said diisocyanate to hydroxyl groups of said polymeric polyols is in the range of about 1.5/1 to about 3/1 and where the amino groups of said 4,4'-methylene dianiline complex to excess isocyanato groups over said hydroxyl groups is in the range of about 0.7/1 to about 1.2/1.

4,071,280

VEHICLE WHEEL APPARATUS

Dalton M. Davis, Palos Verdes Estates, Calif., assignor to Pyramid Enterprises, Inc., Torrance, Calif.

Filed Nov. 30, 1970, Ser. No. 93,724
Int. Cl.[2] B60B *1/08*
U.S. Cl. 301—65 **10 Claims**



1. A vehicle wheel assembly comprising:

a central spider section formed of nonferrous metal and providing a hub and a full outer peripheral ring, and having a plurality of circumferentially spaced, radially inwardly extending dimplelike depressions formed in the outer surface of said ring remote from said hub, said depressions being of diminishing cross section in at least the outer portion thereof; and a pneumatic tire rim of malleable metal surrounding said central spider section in concentric relationship therewith and with an inner surface engaging said ring;

said rim having dimples formed therein providing radially inwardly extending protuberances extending into the aforesaid depressions in the peripheral surface of said central spider section in a tight fit therewith and in intimate contact with at least the upper edge and the outer portion of the sides of said depressions, so as to hold said rim and said central spider section in a rigid unitary assembly.

4. The method of making a wheel assembly comprising the steps of:

a. providing a spider assembly having a plurality of radially extending, equiangularly spaced spokes;

b. forming radially inwardly a plurality of circumferentially spaced conical depressions in the periphery of each of said spokes;

c. locating the spider assembly within a circular rim, said step of locating including establishing an interference fit between the rim and the spider assembly; and

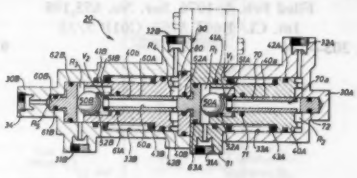
d. permanently deforming portions of the rim into and adjacent each of said conical depressions.

4,071,281

FLUID PRESSURE CONTROL DEVICE FOR CROSSED PIPING BRAKE SYSTEM

Nogami Tomoyuki, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jan. 24, 1977, Ser. No. 762,121
Claims priority, application Japan, July 12, 1976, 51-82671
Int. Cl.[2] B60T *8/14, 17/18*
U.S. Cl. 303—24 A **7 Claims**



1. A fluid pressure control device for a brake system of a vehicle having two front wheels and two rear wheels, the system having a tandem master cylinder, a first braking fluid circuit connecting a first pressure chamber of said master cylinder to one front-wheel brake cylinder and the brake cylinder of one rear wheel diagonally opposite to said one front-wheel, and a second braking fluid circuit connecting a second pressure chamber of said master cylinder to the other front-wheel brake cylinder and the diagonally opposite other rear-wheel brake cylinder, comprising:

a housing provided thereon with first inlet and outlet ports disposed within said first fluid circuit and respectively in connection with the first pressure chamber of said master cylinder and the one rear-wheel brake cylinder, second inlet and outlet ports disposed within said second fluid circuit and respectively in connection with the second pressure chamber of said master cylinder and the other rear-wheel brake cylinder, and a bypass port in connection with the first pressure chamber of said master cylinder through said first fluid circuit, said housing being provided therein with a first bore communicating said first inlet and outlet ports to each other and a second stepped bore communicating said second inlet and outlet ports to each other and in communication with said bypass port at the small diameter portion thereof;

partition means provided between said first bore and said second stepped bore to isolate said two bores from each other;

a first valve seat provided within said first bore to permit fluid flow between said first inlet and outlet ports therethrough;

a first inertia-controlled ball housed within said first bore to co-operate with said first valve seat to cut-off communication between said first inlet and outlet ports when said ball is subjected to a deceleration in excess of a predetermined value;

a movable stepped spool slidably received by said partition means and including a larger end slidable within said first bore and a smaller end exposed within the large diameter portion of said second stepped bore, said spool being provided with a second valve seat at the smaller end thereof and a passage communicating said second inlet and outlet ports to each other through said second valve seat;

a second inertia-controlled ball housed within the large diameter portion of said second stepped bore to co-operate with said second valve seat to cut-off communication between said second inlet and outlet ports when said second ball is subjected to the said deceleration; and

a stepped piston slidably disposed within the large and small diameter portions of said second stepped bore to provide a pressure chamber in communication with said bypass port, wherein the smaller end of said piston is exposed in

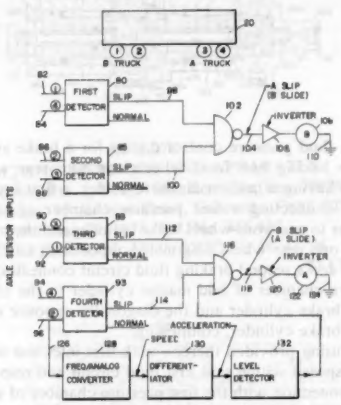
said pressure chamber and the larger end is exposed in the large diameter portion of said second stepped bore.

4,071,282

SLIP-SLIDE DETECTOR SYSTEM FOR RAILWAY CAR WHEELS

Bernard E. Callahan, Hoffman Estates, and Edward A. Christianson, Niles, both of Ill., assignors to Vapor Corporation, Chicago, Ill.

Filed Feb. 4, 1976, Ser. No. 655,199
Int. Cl.² B60T *8/02*; G01P *3/58*
U.S. Cl. 303—106 **9 Claims**



1. In a vehicle having at least first and second axle trucks, each truck having at least two axles thereon, a slip/slide detection system comprising:

first sensor means connected to a first axle on the first truck for generating digital signals indicative of the angular velocity of this axle;

second sensor means connected to a second axle on the first truck for generating digital signals indicative of the angular velocity of this axle;

third sensor means connected to a third axle on the second truck for generating digital signals indicative of the angular velocity of this axle;

fourth sensor means connected to a fourth axle on the second truck for generating digital signals indicative of the angular velocity of this axle;

first detecting means having its inputs connected to the outputs of the first sensor means and the fourth sensor means for detecting a preselected velocity difference between the first and fourth axles;

second detecting means having its inputs connected to the outputs of the second sensor means and the third sensor means for detecting a predetermined velocity difference between the second and third axles;

third detecting means having its inputs connected to the outputs of the third and first sensor means for detecting a preselected velocity difference between the third and first axles;

fourth detecting means having its inputs connected to the outputs of the fourth and second sensor means for detecting a preselected velocity difference between the fourth and second axles;

first gating means having inputs thereof connected to the outputs of the first and second detecting means for signifying a slip condition of the second truck or slide condition of the first truck;

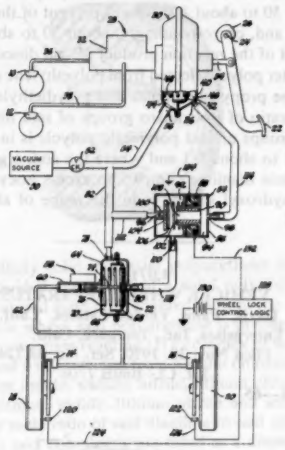
second gating means having inputs thereof connected to the outputs of the third and fourth detecting means for signifying a slip condition of the first truck or slide condition of the second truck.

4,071,283

MASTER AND SLAVE BREAK BOOSTERS FOR FRONT AND REAR WHEEL BRAKES WITH WHEEL LOCK CONTROL

Robert M. Van House, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed May 26, 1976, Ser. No. 690,191
Int. Cl.² B60T *8/04*
U.S. Cl. 303—114 **2 Claims**



1. A vehicle brake system having front and rear brakes with wheel lock control of the rear brakes, said system comprising:

a source of vacuum;

a master brake booster and master cylinder assembly operable by a vehicle operator and connected to actuate the vehicle front brakes, the booster being a vacuum suspended booster having a vacuum chamber and a variable pressure chamber and pressures therein, the pressure in the variable pressure chamber being controlled during assembly actuation in accordance with operator operation of the booster;

a slave brake booster and master cylinder assembly connected to actuate the vehicle rear brakes, the slave booster being a vacuum suspended booster having a vacuum chamber and a variable pressure chamber and being capable of delivering a boost force to the slave master cylinder;

first conduit means connecting said master brake booster vacuum chamber and said slave brake booster vacuum chamber with said vacuum source;

second conduit means having a solenoid operated valve therein which when de-energized connects said master brake booster variable pressure chamber and said slave brake booster variable pressure chamber, said solenoid operated valve when energized disconnecting the variable pressure chambers and connecting said slave brake booster variable pressure chamber with said first conduit means to impose vacuum therein independently of the operation of said master brake booster and thereby reduce the braking action of the rear brakes by reducing the boost force of said slave brake booster;

and wheel lock control logic and incipient wheel lock sensing means for the vehicle rear brakes connected to energize and de-energize said solenoid operated valve, thereby selectively cycling said valve to generate a pressure in said slave brake booster variable pressure chamber from vacuum and the variable pressure in said master brake booster variable pressure chamber, said pressure so generated causing a lesser pressure differential actuating said slave brake booster than the pressure differential actuating said master brake booster and tending to prevent rear wheel

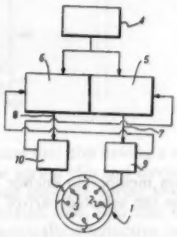
lock due to lesser brake energization by said slave brake booster and master cylinder assembly.

4,071,284

METHOD AND APPARATUS FOR EFFECTING DOUBLE-ACTING BRAKING

Jean Masclet, Paris, and Marcel Schott, Fontenay-le-Fleury, both of France, assignors to Messier-Hispano, Montrouge, France

Continuation-in-part of Ser. No. 602,516, Aug. 6, 1975, abandoned. This application Mar. 8, 1977, Ser. No. 775,636
Claims priority, application France, Aug. 7, 1974, 74 27479
Int. Cl.[2] B60T 7/12
U.S. Cl. 303—63 8 Claims



1. A method for effecting double-acting braking for a wheel permitting compensation of failures of at least one of the braking circuits of a double-acting braking arrangement of the type comprising at least two sets of braking members and two braking circuits for each brake, the method comprising using a single control action and acting simultaneously on the two braking circuits of each of the brakes and, in the case of a failure of one of the two braking circuits resulting in a drop in pressure in the failed braking circuit and consequently in a reduction of the braking torque applied by the brake, acting on the remaining circuit to increase the pressure in the remaining circuit and the braking torque automatically by a predetermined value, by applying the control action simultaneously to two relays having at least two operating pressure levels, each acting on one of the two sets of braking members by the two braking circuits, detecting failures that may occur in said braking circuit, increasing the pressure level of the relay associated with the braking circuit that remains in operation when a failure is detected in the other circuit, and disconnecting the failed circuit.

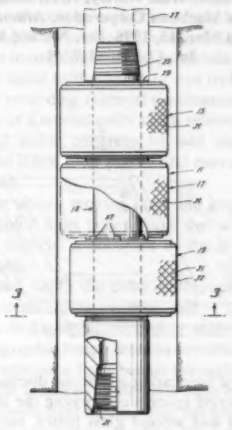
4,071,285

STABILIZER

Jackson M. Kellner, Midland, Tex., assignor to Smith International, Inc., Midland, Tex.

Filed Sept. 7, 1976, Ser. No. 720,695
Int. Cl.[2] F16C 17/00
U.S. Cl. 308—4 A 10 Claims

1. Wall contacting tool comprising a mandrel having a plurality of eccentric roller assemblies disposed in tandem along the length of the mandrel, each of the assemblies being provided with orientation means independent of the mandrel to prevent the assemblies from being positioned in full axial engagement except when in any one of a predetermined limited



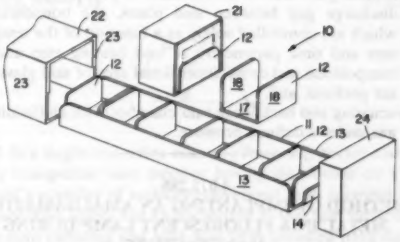
number of fixed relative azimuthal orientations of the common eccentric diameters.

4,071,286

SLIDE STORING APPARATUS

John W. Moyer, 2342 Jackson St., Fremont, Calif. 94538

Filed Dec. 6, 1976, Ser. No. 747,503
Int. Cl.[2] A47B 88/00
U.S. Cl. 312—330 R 5 Claims



1. Apparatus for storing slides, comprising:

an elongated tray member having a bottom and having two sides lower than the height of a slide;

a series of U-shaped slide storage units arranged in end-to-end succession in the tray member;

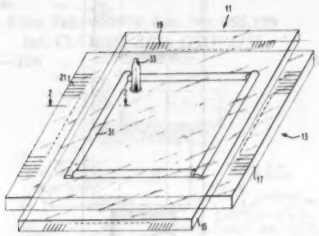
each U-shaped unit having a bottom and front and back end walls, open at sides and top, the distance between the top of one wall and the juncture of the other wall and the unit bottom being less than the height of a slide, so that the top of a single slide in the unit will not fall below the top of a wall; and

each U-shaped unit being sized to receive a cluster of vertically oriented slides facing the front and back end walls of the unit, and each unit being individually removable from the tray member without movement of the remaining units in the tray member.

4,071,287
MANUFACTURING PROCESS FOR GASEOUS DISCHARGE DEVICE

Thomas Albert Sherk, West Hurley, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 15, 1976, Ser. No. 666,999
Int. Cl.[2] H01J *9/18*
U.S. Cl. 316—19 **5 Claims**



1. A method of fabricating a gaseous discharge display device without discrete spacers comprising the steps of

providing first and second glass plates, each of said glass plates having arrays of parallel lines overcoated with a dielectric material,

positioning preforms of devitrifiable glass sealant on one of said members in a frame-like border defining the display area of said first and second plates,

placing said second glass plate on said first glass plate to form an assembly wherein the parallel conductor array of said second glass plate extends orthogonally to the parallel conductor array of said first glass plate,

heating said assembly to a controlled temperature above the flow point of said glass sealant preform within a range of 440° - 480° C. for a predetermined time interval whereby said sealant preform deforms, crystallizes and fuses to said plates as it progresses from a viscous to a crystalline state to seal said plates spaced apart a predetermined distance corresponding to the discharge gap between said plates,

placing said upper plate under tension to assist said preformed glass sealant deformation in providing a uniform discharge gap between said plates, the boundaries of which are controlled solely as a function of the temperature and time parameters of said heating step and the composition and cross-dimensional area of said glass sealant preform, and,

evacuating and backfilling said chamber with an illuminable gas under a defined pressure.

4,071,288
METHOD OF IMPLANTING AN AMALGAMATIVE METAL IN A FLUORESCENT LAMP DURING MANUFACTURE

George S. Evans, Caldwell, and Henry Skwirut, Verona, both of N.J., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

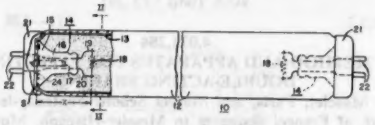
Division of Ser. No. 593,814, July 7, 1975, Pat. No. 4,015,162.
This application Aug. 17, 1976, Ser. No. 715,257
Int. Cl.[2] H01J *9/18*
U.S. Cl. 316—19 **6 Claims**

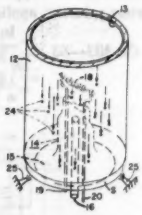
1. In the manufacture of a mercury-vapor discharge device such as an electric discharge lamp which has an hermetically sealed envelope, the method of placing a measured quantity of a mercury-amalgamative metal at a predetermined fixed location within said envelope before the latter is hermetically sealed, which method comprises;

including a vitreous member as an integral stationary component of said device and arranging it so that a selected part of the member is positioned at said fixed location within the envelope,

heating the vitreous member so that at least the said selected part thereof is softened sufficiently to have an adhesive surface,

introducing the measured quantity of amalgamative metal into the unsealed envelope and orienting the latter so that the falling metal strikes and sticks to the adhesive surface of the selected heat-softened part of said vitreous member,





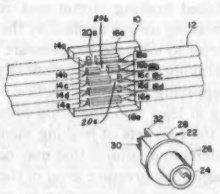
cooling the vitreous member to anchor the amalgamative metal in place on the selected part of said member, and then

completing the fabrication of said device.

4,071,289
ELECTRICAL CONNECTOR ASSEMBLY FOR RIBBON TYPE ELECTRICAL CABLE

Robert G. Szudarek, Warren, Mich., assignor to Essex Group, Inc., Fort Wayne, Ind.

Filed Jan. 21, 1977, Ser. No. 761,506
Int. Cl.[2] H01R *9/12*
U.S. Cl. 339—17 F **3 Claims**



1. An electrical connection assembly, comprising:

an elongated ribbon type electrical cable having a plurality of elongated, flat, coplanar, flexible electrical conductors, and a continuous insulative sheath in intimate contact with and surrounding said flat conductors, an entire intermediate segment of said insulative sheath being removed so as to expose said flat electrical conductors, the exposed portion of said flat electrical conductors being axially twisted so that the plane defined by each such exposed portion is generally perpendicular to the plane defined by said cable;

an insulative base member adapted for cooperation with said ribbon type cable, said base member including means thereon for electrically insulating said twisted conductors from one another;

an insulative cover member adapted to mate with said base member so as to form an enclosure for the exposed portion of said electrical conductors; and

electrical terminal means in said cover member and engag-

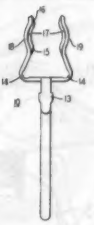
ing the exposed portion of said electrical conductors for making contact to said electrical conductors.

4,071,290

UNITARY FUSE CLIP HAVING A WIRE WRAP TERMINAL

Ernest Gerard DeNigris, Colts Neck, and Albert John Tutko, Belle Mead, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J. and Western Electric Company, Inc., New York, N.Y.

Filed Sept. 27, 1976, Ser. No. 726,965
Int. Cl.[2] H01R *13/12*
U.S. Cl. 339—258 F **3 Claims**



1. A spring tension fuse clip having a wire wrap leg formed integrally with the spring clip and having a U shape adapted for mating with and applying spring tension to one electrical terminal of an inserted fuse, said clip being formed from a single piece of electrically conductive material having a first gauge,

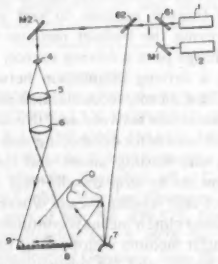
said U shape having two side portions and a lower portion, said side portions bent upward from said lower portion, wherein the material only within the bends formed between said side portions and said lower portion of said U is reduced in gauge so as to reduce the spring tension of said clip against an inserted fuse.

4,071,291

HOLOGRAPHIC METHOD FOR FORMING COLOR HOLOGRAMS

Masane Suzuki; Motonori Kanaya, and Takeshi Matsuoka, all of Omiya, Japan, assignors to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Oct. 22, 1975, Ser. No. 624,831
Claims priority, application Japan, Oct. 23, 1974, 49-122678
Int. Cl.[2] G03H *1/30*
U.S. Cl. 350—3.5 **3 Claims**



1. A method for forming and reconstructing a color holographic image comprising the steps of:

placing a stripe filter on the surface of a holographic recording material, said stripe filter having transparent stripes of equal width at equal intervals separated by opaque stripes, the ratio of the width of the transparent stripes to the opaque stripes therebetween being 1: (number of different color light beams used for recording the color holographic image)-1,

exposing the recording material simultaneously to an object light beam of a first color and a reference light beam of the first color coherent to said object light beam through the stripe filter placed on the recording material, moving said stripe filter in one direction perpendicular to the stripes by the length equal to the width of one transparent stripe,

exposing the recording material simultaneously to an object light beam of a second color and a reference light beam of the second color coherent to said object light beam through the stripe filter placed and moved on the recording material,

repeating the above moving step and exposing step with different color light beams until the whole area of the recording material is occupied by the stripes of different color images,

developing and fixing the color holographic image on the holographic recording material, and

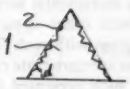
exposing the holographic recording material carrying the color holographic image thereon simultaneously to different color reference light beams through stripe filters inserted in the respective reference light beams, the colors of the reference light beams being the same as those of the light beams used for recording the color holographic image on the recording material, the stripe filters inserted in the reference light beams having transparent stripes for making the reference light beam of one color impinge upon the color holographic image recorded on the recording material of the same color as the one color.

4,071,292

FOCUSSING PLATE

Katsuhiro Ise, Sakai; Yoshio Kuramoto, Toyonaka, and Yasuo Yamazaki, Kawachi-Nagano, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 2, 1976, Ser. No. 710,987
Claims priority, application Japan, Aug. 27, 1975, 50-104233
Int. Cl.[2] G03B *21/60*
U.S. Cl. 350—128 **17 Claims**



12. In a single lens reflex camera a focussing device comprising a transparent base member having distributed on a face thereof a plurality of surfaces convergent from enlarged bases to respective apices and characterized in that said surfaces are each light diffusing and have fine light diffusing irregularities formed thereon.

4,071,293

CONTACT LENS AND METHOD OF MAKING SAME

Theodore P. Avery, 511 W. 6th St., Oil City, Pa. 16301

Division of Ser. No. 516,140, Oct. 18, 1974. This application Apr. 23, 1975, Ser. No. 570,943
Int. Cl.[2] G02B *5/23*
U.S. Cl. 351—160 **7 Claims**

1. A contact lens comprising a plastic lens member having a central axis, a generally annular ring formed of metal susceptible to magnetic attraction and having a continuously varying cross-section embedded in said lens concentrically with respect to the axis of said lens, said ring member being of varying cross-section so that one portion of said ring is thicker than the

diametrically opposite portion of said ring so that the center of gravity of said lens and ring assembly is below the geometric

center of said lens so that said lens is rotated by gravity to a desired lens orientation in the eye of a person wearing said lens.

4,071,294

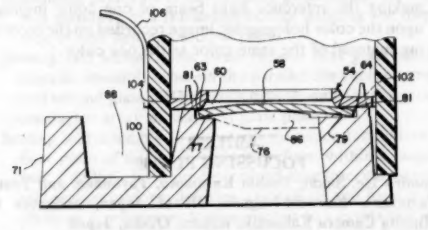
PHOTOGRAPHIC APPARATUS INCLUDING IMPROVED APERTURE PLATE

Peter A. Scibilia, Westwood, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation of Ser. No. 416,080, Nov. 15, 1973, abandoned. This application Aug. 6, 1976, Ser. No. 712,381

Int. Cl.² G03B *1/48*

U.S. Cl. 352—72 **22 Claims**



1. A photographic system comprising:

a cassette comprising a cassette housing for retaining a strip of photographic film material, said cassette housing including an opening in an edge wall thereof configured to present at least an incremental section of such film strip for cooperation with other apparatus for providing a photographic program with such film strip, and an apparatus comprising an aperture plate configured to engage at least a portion of such presented incremental section of such film strip and support such portion of such incremental section in a predetermined focal position when such cassette is operatively positioned within said apparatus, means for receiving said cassette with such presented incremental section of such film operatively located on said aperture plate, said receiving means being configured for translation of such presented incremental section laterally across said aperture plate as said cassette is operatively located in said receiving means, said aperture plate including a longitudinal channel laterally bounded by spaced film margin engaging surfaces for supporting the margins of such film strip when such film strip is operatively located on said aperture plate, and said aperture plate including a ramp-like portion extending substantially from the bottom of said channel to one of said margin engaging surfaces so as to urge said film out of said channel and to said one margin engaging surface when such film strip is translated laterally across said aperture plate towards said one margin engaging surface during the operation location of such film on said aperture plate, and means for cooperating with such incremental section of such film strip so as to provide such photographic program therewith when such incremental section is located in said predetermined focal position.

4,071,295

COPYING APPARATUS FOR SHEET ORIGINALS AND THICKER ORIGINALS

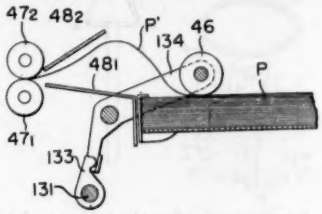
Shigehiro Komori; Hisashi Sakamaki, both of Yokohama; Hiroyuki Hattori, Mitaka; Toshihide Iida, Tokyo; Koichi Miyamoto, Tokyo, and Kazumi Umezawa, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

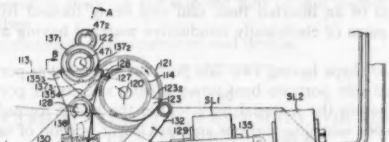
Continuation of Ser. No. 413,210, Nov. 6, 1973, abandoned, which is a division of Ser. No. 258,820, June 1, 1972, Pat. No. 3,804,512. This application Apr. 30, 1975, Ser. No. 573,144

Claims priority, application Japan, June 9, 1971, 46-48632; June 3, 1971, 46-38917; June 3, 1971, 46-38918; June 10, 1971, 46-41195; June 10, 1971, 46-41196; June 10, 1971, 46-41197; June 21, 1971, 46-44611; Aug. 30, 1971, 46-66740

Int. Cl.² G03G *15/00*; B65H *9/04*

U.S. Cl. 355—3 SH **3 Claims**





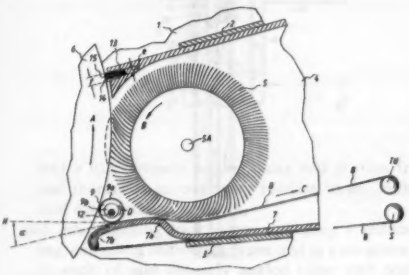
1. A copying apparatus including means for carrying an original to be copied; a photosensitive medium; an optical system for projecting on the photosensitive medium, an image of the original carried by said carrying means; means for forming an image on the photosensitive medium; means for developing the image formed by the image forming means; means operable at a transfer station for transferring the image onto a transfer medium; means for registering said transfer medium with said photosensitive medium at said transfer station; means for feeding the transfer medium to said registering means; means for conveying the transfer medium from the transfer station to a discharge port; a driving source; first clutch means for establishing a driving connection between said driving source and said feed means; second clutch means for establishing a driving connection between said driving source and said registering means; means for controlling said first clutch means to start driving said feeding means and for controlling said second clutch means to stop driving said registering means after said start of said feeding means wherein said control of said first and second clutch means is continued until the leading edge of said transfer medium is stopped by engaging the undriven registering means, and for subsequently controlling said first clutch means to cease driving the feeding means and said second clutch to start driving said registering means; and delay means for maintaining the driving of said registering means by said second clutch means for a predetermined time period after the commencement of feeding of a next successive transfer medium, wherein at the conclusion of said time period said second clutc interrupts the driving of the register rollers to

stop said next succeeding transfer medium at its leading edge engages said medium registering means.

4,071,296
ELECTROSTATIC-COPIER CLEANING DEVICE

Heinrich Ermel, Munich; Franz Fruth, Unterpfaffenhofen; Georg Fryda; Peter Lang, both of Munich; Fritz Rau, Unterhaching, and Jürgen Vossnacke, Hohenschaftlarn, all of Germany, assignors to AGFA-Gevaert, AG, Leverkusen, Germany

Filed Feb. 17, 1976, Ser. No. 658,603
Claims priority, application Germany, Feb. 19, 1975, 2507152
Int. Cl.[2] G03G *21/00*
U.S. Cl. 355—15 **6 Claims**



1. In an electrostatic copier of the type having a drum-shaped charge carrier rotatable about an axis of rotation and provided with a photosensitive surface which is electrostatically chargeable to form a latent image to which toner particles are attracted for subsequent transfer to an image carrier, and a cleaning arrangement for removing residual toner particles from said surface prior to the next electrostatic charging thereof, the improvement comprising a cleaning cartridge adapted for in toto insertion and removal from said copier, said cartridge having a leading open end in part bounded by two edges extending substantially parallel to said axis and cleaning means at said open end so as to engage said photosensitive surface when said cartridge is inserted into said copier, said cleaning means comprising a cleaning roller, a guide member below said cleaning roller and a cleaning tape which contacts the periphery of said cleaning roller and is trained about said guide member and has portions located proximal to said photosensitive surface in a position in which brushed-off toner particles drop onto said portions; and yieldable sealing means at said cartridge at least in part bounding said open end and yieldingly sealing said open end in engagement with said photosensitive surface in response to insertion of said cartridge into said copier, said sealing means comprising a sealing roller extending along said portions lengthwise of said drum and sealingly engaging said portions and said photosensitive surface.

4,071,297
METHOD AND APPARATUS FOR PHOTOELECTRICALLY DETERMINING THE POSITION OF AT LEAST ONE IMAGE FOCUS PLANE

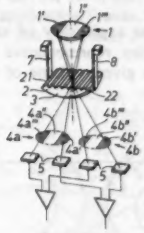
Ludwig Leitz; Knut Heitmann; Eckart Schneider, all of Wetzlar, and Klaus Dieter Schaefer, Braunfels, all of Germany, assignors to Ernst Leitz GmbH, Wetzlar, Germany

Continuation-in-part of Ser. No. 479,525, June 14, 1974, abandoned. This application Apr. 5, 1976, Ser. No. 673,726
Claims priority, application Germany, June 18, 1973, 2330940
Int. Cl.[2] G01C *3/08*
U.S. Cl. 356—4 **47 Claims**

1. In a method for determining the position of a focusing plane of an image within an optical device including an optical imaging system, the improvement comprising the steps of defining the entrance pupil of said optical imaging system into a plurality of different regions (**1′**; **1‴**; **1ᴵⱽ**; **1ᵛ**); imaging via said optical imaging system at least one object to be measured which is emitting light fluxes traversing said regions as a set of light fluxes on at least one spatial frequency filter (**2**; **12**) of an optical image correlator;

jointly modulating said set of light fluxes by means of said spatial frequency filter;

splitting said set of light fluxes corresponding to the respective pupil regions into a pair of sets of partial light fluxes;



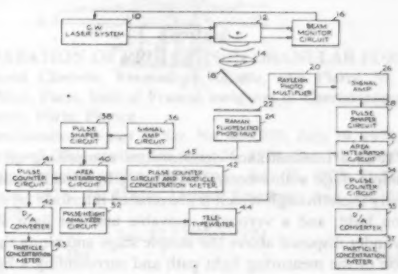
applying each of said partial light fluxes to photoelectric receiving means (**5c**, **5d**; **5g′**; **5r**; **5r′**) for generating electrical output signals corresponding to said partial light fluxes; and

processing said signals to derive further electrical signals being indicative of positions of the focusing plane.

4,071,298
LASER RAMAN/FLUORESCENT DEVICE FOR ANALYZING AIRBORNE PARTICLES

David G. Falconer, Menlo Park, Calif., assignor to Stanford Research Institute, Menlo Park, Calif.

Continuation-in-part of Ser. No. 483,786, June 27, 1974, abandoned. This application May 17, 1976, Ser. No. 686,942
Int. Cl.[2] G01N *15/02*
U.S. Cl. 356—73 **7 Claims**



1. Apparatus for determining the physical and chemical state of aerosol particles comprising

laser means for establishing a light beam,

means for passing a stream of aerosol particles through said light beam whereby each said particle generates Raman and fluorescent radiation in addition to Rayleigh radiation

dichroic filter means for separating said Raman and fluorescent radiations from said Rayleigh radiation,

bandpass filter means in the path of said Raman and fluorescent radiations for passing a selected portion of either the Raman or fluorescent radiation therethrough having frequencies in accordance with the chemical composition of the particles whose physical and chemical states it is desired to be determined.

photomultiplier means for generating pulse signals responsive to the radiation from each particle that has passed through said bandpass filter means,

means to which the output of said photomultiplier means is

applied for producing a display of particles in the stream passing through said laser beam sorted in accordance with the size of the masses,

means to which the output of said photomultiplier means is also applied to producing a display indicative of the mass concentration of particles in the stream passing through said laser beam,

Rayleigh photomultiplier means for generating a pulse signal responsive to the Rayleigh radiation from each particle, and

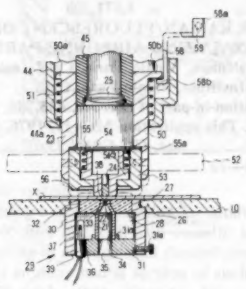
means responsive to a plurality of said pulse signals for providing a display representative of the particle size distribution for a given volume of said aerosol particle stream.

4,071,299

TRANSMITTANCE DENSITOMETER

Tadashi Amano; Yoshitaka Mukaihara, and Tadashi Nakamura, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed May 14, 1976, Ser. No. 686,268
Claims priority, application Japan, May 16, 1975, 50-65149
Int. Cl.[2] G01N *21/22*
U.S. Cl. 356—202 **11 Claims**



1. In a transmittance densitometer comprising an annular sample stage with a central measuring light path passing centrally therethrough which is illuminated interiorly by illumination light, and a vertically movable ambient light shielding cylinder disposed above the sample stage and along the extension of the measuring light path and surrounding a light path communicating in extension with the measuring light path, the improvement which comprises

an annular illumination plate made of a semi-transparent substance disposed centrally inside of said sample stage coaxially therewith annularly surrounding the measuring light path and capable of diffusing transmission light,

an internal light shielding box defining a light shielding cylinder and disposed beneath said illumination plate forming a local illumination chamber optically isolated from the illumination light in the measuring light path and the sample stage,

an electric switch means for responding to the level of the ambient light shielding cylinder relative to the sample stage, and

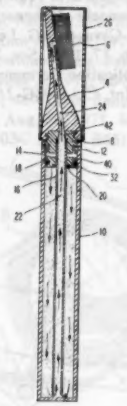
an illumination lamp disposed in said local illumination chamber and operatively connected to said electric switch means for being turned off by said electric switch means when said ambient light shielding cylinder is moved so as to be close to said sample stage.

4,071,300

SELF-PASTING TOOTHBRUSH

Roy A. Nichols, 6821 Racliffe St., Bristol, Pa. 19007, and Francis L. Anderson, 13110 Theiss Lane, Tomball, Tex. 77375

Filed Sept. 30, 1976, Ser. No. 728,435
Int. Cl.[2] B43K *5/06*
U.S. Cl. 401—175 **12 Claims**



1. A self-pasting toothbrush comprising in combination:

a. a brush head having a face portion and a bottom end;

b. brush bristles extending from said face portion of said brush head;

c. a replaceable cartridge comprising connector means, one end of said connector means removably secured to said bottom end of said brush head, said connector means also having a channel bored therein,

a hollow paste reservoir having an open end and a closed end, said open end of said paste reservoir engaged to the other end portion of said connector means, said paste reservoir being rotatable in relation to said brush head,

piston means having a threaded bore therethrough, said piston means being snugly positioned within said paste reservoir, and

a threaded feed rod, one end of which is fixedly anchored in said connector means, the other end of which is threaded through the bore contained within said piston means, said feed rod extending into said paste reservoir, said various means and members being adapted to permit said piston to move along the axis of said feed rod when said paste reservoir is rotated relative to said brush head, to force any toothpaste located in said reservoir to and through said channel formed in said connector means;

d. conduit means bored through said brush head to communicate with said channel bored in said connector means, said conduit means adapted to deliver toothpaste to the face portion of said brush and thus to said bristles.

4,071,301

CORNER GUSSETT

Roger D. Pritchard, 100 S. 17th St., Sebring, Ohio 44672

Filed Nov. 26, 1976, Ser. No. 745,437
Int. Cl.[2] E04B *1/38;* B25G *3/00;* F16B *7/00*
U.S. Cl. 403—231 **2 Claims**

1. A corner gusset for joining the end portions of two angularly related rails of a hollow frame structure having cooperating, inwardly opening channel shaped rail portions comprising,

a first member, generally in the form of an integrally formed angle bracket;

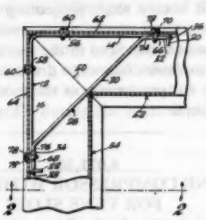
a second member in a spanning relation to extended end portions of first and second angular legs of said angle bracket;

interengaging lock means between opposed end portions of said second member and said extended end portions;

means to attach said gusset within the two angularly related rails to form a rigid corner structure,

an inwardly turned flange at the outer end of each of said extended end portions,

said second member includes a main central span portion defining an outer obtuse angle relative to each of said legs,



and a like obtusely angled outer end portion from each end thereof in an overlying relation to an inside face of said extended end portions,

said interengaging lock means including a reduced width lug, extending outwardly from, and in a co-planar relation to each of said obtusely angled outer end portions for engagement through a companionately shaped and sized aperture through one of said flanges.

4,071,302

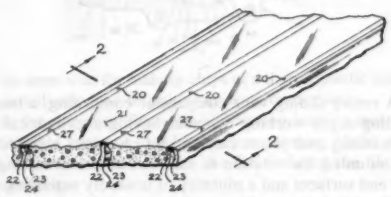
AISLE DESIGNATORS

Theodore Henry Allegri, Sr., 5617 Fairmont, Peoria, Ill. 61614

Filed Sept. 22, 1976, Ser. No. 720,300

Int. Cl.[2] E01F *9/08*

U.S. Cl. 404—12 **3 Claims**



1. An aisle designator for use with a surface having a groove structure formed therein, said aisle designator comprising:

indicator means having first and second surfaces and a peripheral edge, said first surface being convex in conformation, said second surface being planar, said peripheral edge being formed by the juncture of said first and second surfaces, said peripheral edge defining a circle, said indicator means having an axis of symmetry normal to said second surface and intersecting the center of said circle, said indicator means having a bore formed therethrough, said bore having a bore longitudinal axis normal to said second surface and offset from said axis of symmetry toward said peripheral edge;

anchor means having an annular configuration, said anchor means being attached normal to said second surface, the longitudinal axis of said anchor means being aligned with said axis of symmetry, said anchor means having a cross-sectional diameter less than the diameter of said circle, said second surface having an interior bearing portion and a peripheral bearing portion defined by said anchor means; and

the groove structure being annular in conformation and normal to the surface, said anchor means fitting flush within the groove structure, said interior and peripheral bearing portions fitting against said surface.

4,071,303

ROTARY MACHINE HAVING A SUSPENDED SHAFT

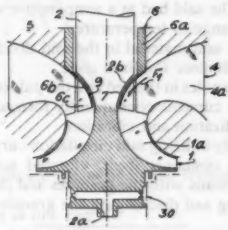
Joël Guidez, Aix-en-Provence; Paul Lecouvreur, Fresnes, and Jean Roumailhac, Versailles, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Mar. 18, 1976, Ser. No. 667,980

Claims priority, application France, Mar. 18, 1975, 75 08543

Int. Cl.[2] F04D *29/04*

U.S. Cl. 415—112 **5 Claims**



1. A rotary machine having a vertical drive shaft of varying diameter suspended from the upper end thereof and provided at the lower end thereof with an impeller-wheel surrounded by a casing in which is incorporated a suction chamber fitted with stationary radial vanes integral with the casing, wherein said shaft is rotatably mounted in a hydrostatic bearing placed beneath said impeller-wheel, a removable stationary sleeve being mounted coaxially with said shaft between said suction chamber and said impeller-wheel, said sleeve including a surface of revolution having its axis coincident with the axis of rotation of said shaft, said surface of revolution having a diameter varying in direct constant relation to the diameter of said shaft.

4,071,304

SEPARATION OF PRODUCTS IN GRANULAR FORM

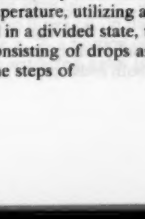
Raymond Chauvin, Verneuil-en-Halatte, and Pierre M. M. Guillon, Paris, both of France, assignors to Charbonnages de France, Paris, France

Continuation-in-part of Ser. No. 490,033, July 19, 1974, abandoned. This application May 26, 1976, Ser. No. 690,064

Claims priority, application France, July 27, 1973, 73 27584; June 24, 1974, 74 21826; United Kingdom, Aug. 18, 1975, 34285/75

Int. Cl.[2] B05D *1/24*

U.S. Cl. 427—185 **23 Claims**



1. A method for processing granules in a bed of particles of a product partially fluidized by a fluidization agent in a predetermined range of temperature, utilizing at least a raw material formed and processed in a divided state, the said divided state being of the group consisting of drops and granules, the said method comprising the steps of

forming a vertical columnar fluidized bed zone in a container having sidewalls and at least one endwall, forming a vertical columnar non-fluidized zone in said container extending substantially the length of said sidewalls and parallel thereto, the vertical columnar non-fluidized zone constituting at least one horizontal channel having a horizontal direction, the channel not being subjected to the fluidizing agent;

vibrating the container with vibrations directed to apply to each point of each channel with vibrations oriented at an angle of 0° to 80° to the horizontal, in a vertical plane substantially in the direction of the channel, said vibrations serving to move the particles and the granules in the direction of the channel;

maintaining the said bed at a temperature within the predetermined range of temperature;

dropping the said material in the said divided state into the vertical columnar fluidized zone;

subjecting granules in the bed and the pulverulent product to circulation currents consequently formed during simultaneous fluidization and vibration;

simultaneously utilizing said circulation currents for feeding, within the container itself, vibrated screening and discharging means with the granules and the particles;

and extracting and discharging the granules to the outside.

4,071,305

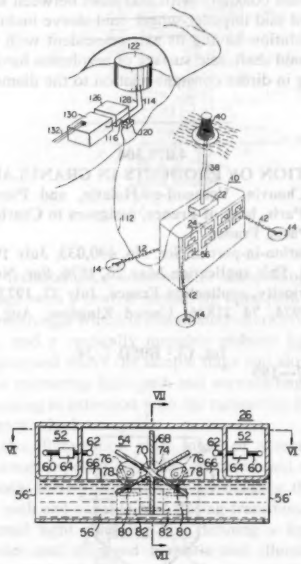
TRANSDUCER FOR CONVERSION OF TIDAL CURRENT ENERGY

Fumio Ootsu, 6-4, Shirahae-cho, Saseho Nagasaki, Japan

Filed Oct. 13, 1976, Ser. No. 732,187

Int. Cl.[2] F04B *17/02*; F03B *4/10*

U.S. Cl. 417—334 **3 Claims**



1. A transducer apparatus for converting an energy of a tidal current to an energy of a high pressure fluid, comprising, in combination, a housing in the form of a rectangular box, a pair of atmosphere compartments disposed on the opposite end portions of said housing thereof and in fluid communication with each other and with the atmosphere, a plenum space and a sea-water channel disposed between said pair of atmosphere compartments within said housing, said sea-water channel being overlain with said plenum space to communicate with the latter and having both ends opened into the exterior of said housing, an impeller disposed within said communicating plenum space and sea-water channel so that an upper half thereof is located in said plenum space and the substantial portion of its lower half is located in said sea-water channel, said impeller including a rotary shaft disposed slightly above and in parallel to an interface between the plenum space and the sea-water channel to project into both atmosphere compartments, and a mechanism for producing a motive fluid disposed in each of said atmosphere compartments to be operatively coupled to the end of said rotary shaft projecting into the associated atmosphere compartment, the arrangement being such that, with the apparatus submerged in the sea, a tidal current flows through said sea-water channel to drive said impeller to cause said mechanism for producing, as the motive fluid, high pressure air from the air.

4,071,306

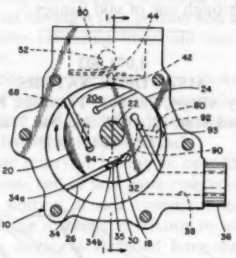
ROTARY VANE COMPRESSOR WITH RELIEF MEANS FOR VANE SLOTS

Peter Trent Calabretta, York, Pa., assignor to Borg-Warner Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 568,747, April 16, 1975, abandoned, and a continuation-in-part of Ser. No. 568,748, April 16, 1975, abandoned, and a continuation-in-part of Ser. No. 568,749, April 16, 1975, abandoned. This application Feb. 9, 1976, Ser. No. 656,480

Int. Cl.[2] F04C *29/02*

U.S. Cl. 418—82 **2 Claims**



1. A rotary sliding vane compressor comprising: a housing providing a gas working chamber having a cylindrical wall and including end plates closing said chamber; a cylindrical rotor mounted for rotation in said chamber and having opposed end surfaces and a plurality of inwardly extending vane slots formed therein; said rotor being in sliding contact with said cylinder wall at a contact point; a gas inlet port communicating with said chamber; a gas discharge port adjacent said contact point communicating with said chamber; a gas discharge chamber associated with said housing, said gas discharge chamber having a sump portion for the accumulation of lubricating fluid separated from said gas; a plurality of vanes slidable in said vane slots each having one end thereof flush with one of the end surfaces of said rotor, a vane tip in contact with said cylindrical wall and a lower edge defining, in cooperation with the bottom of said vane slots and at least one of said end plates, an undervane space; means defining a first fluid passage in said one end plate having a fluid supply port at one end of said passage and an inlet at the opposite end, said supply port being located so that it communicates with an undervane space as the rotor moves in a direction from said gas inlet port to said gas discharge port, said fluid supply port being out of communication with said undervane space for a predetermined distance before said vane tip reaches said contact point; means for supplying a substantially incompressible fluid to said inlet whereby said fluid flows through said passage and fills said undervane spaces, trapping a predetermined quantity of fluid in said undervane spaces; said fluid being confined, except for high flow resistance leakage paths between said rotor and said

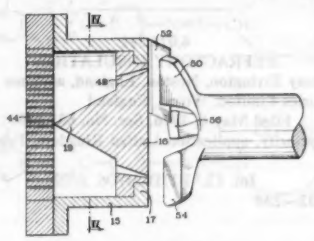
housing, and between said vanes and said vane slots, as said vane approaches said contact point, said last-named means including a conduit through which said fluid is transferred from said sump portion, having an outlet aligned with, but spaced from, said fluid supply passage inlet and a disc-like element interposed between said conduit outlet and said fluid supply passage inlet and driven with said rotor, said element having a plurality of apertures therein adapted to intermittently and periodically interconnect said conduit to said fluid supply passage and means defining a second fluid passage in one of said end plates, said passage having a first portion adapted to communicate with said undervane spaces, said second fluid passage having a portion which extends into said gas working chamber so as to relieve suction created by the vanes moving outwardly during the suction phase.

4,071,307

APPARATUS FOR MAKING CHIPS OF THERMOPLASTIC MATERIAL

Luigi Porro, via Torino 24-26, Villanova Canavese, Turin, Italy

Filed Dec. 10, 1975, Ser. No. 639,376
Claims priority, application Italy, Dec. 16, 1974, 70631/74
Int. Cl.[2] B29F *3/04*
U.S. Cl. 425—72 R **1 Claim**



1. An apparatus for making chips of a thermoplastic material such as polyethylene or polypropylene, comprising:

a die for extruding filaments and having heating means;

a rotatable shearing tool having one shearing blade, operatively associated with the die for shearing the filaments into chips;

an enclosure surrounding the shearing tool and the die, for leading the chips away from the shearing area and toward an outflow aperture;

a hopper placed beneath the outflow aperture of the enclosure for collecting the chips;

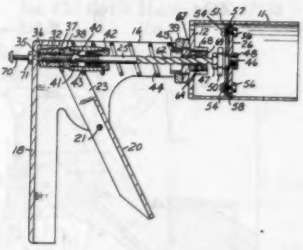
a rotatable impeller located immediately adjacent the lower outlet end of said hopper and cooperating with the hopper for generating an air stream into the hopper and the enclosure, said air stream cooling said shearing blade, and wherein the die comprises a mandrel having a flat plate-like portion and a rearwardly extending conical apex, a cylinder housing the mandrel and a breaker plate engaging the apex of the mandrel, said cylinder defining an extrusion chamber between its inner surface and the conical apex of said mandrel, said flat plate-like portion having extrusion holes in at least two coaxial circular arrays near the periphery thereof, the arrays being displaced by half an angular pitch with respect to each other, said extrusion holes extending at an angle relative to the axis of the die in a radial plane from a point near the center of said extrusion chamber to a point near the periphery of said flat plate-like portion and tapering from said extrusion chamber to said flat plate-like portion.

4,071,308

DISPENSER FOR ICE CREAM OR THE LIKE

John T. LaFreda, 29196 Piping Rock Road, Sun City, Calif. 92381

Filed Apr. 16, 1976, Ser. No. 677,706
Int. Cl.[2] A47J *43/28*
U.S. Cl. 425—284 **1 Claim**



1. A dispenser for ice cream or similar frozen material comprising:

a cylinder open at one end;

means forming a handle for supporting said cylinder at the opposite end thereof;

a piston movable along the axis of said cylinder;

a lever pivotally supported by the handle forming means, said lever extending adjacent said handle;

means connecting said lever to said piston whereby the squeezing of said handle and of said lever together causes said piston to move along said cylinder to eject a scoop of ice cream or similar frozen material therefrom; and

means responsive to the movement of said piston to rotate said piston about said axis;

said dispenser including a scraper connected to said piston so as to be rotatably movable therewith, said scraper being engageable with the inner surface of said cylinder whereby to scrape ice cream adhering to said inner surface therefrom;

said scraper comprising diametrically oppositely disposed scraper blades that extend lengthwise of said cylinder and on the side of said piston adjacent the open end of the cylinder;

said dispenser including means permitting free radial movement of said scraper relative to said piston.

4,071,309

METHOD AND APPARATUS FOR MAKING CEMENT WITH PREHEATER, KILN AND HEAT EXCHANGER FOR HEATING COMBUSTION AIR

Isao Yamane, Ichikawa, Japan, assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

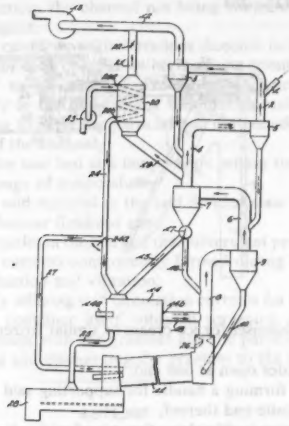
Filed May 28, 1976, Ser. No. 690,990
Int. Cl.[2] F27B *15/00, 7/00*
U.S. Cl. 432—14 **8 Claims**

1. A method of producing such as Portland cement clinker in a system including at least a preheater and a rotary kiln, with the cement being made from pulverant feed material pre-sintered in the preheater and then fed to the rotary kiln, with said pulverants being pre-sintered in a counterflow of kiln waste gases passing through multi-stages (**3**, **5**, **7** and **9**) of raw material preheating in the preheater, and in which a flow (e.g., in flue **4**) of said kiln waste gases from an identified one of said stages (e.g., stage **7**) contains more thermal energy than can be utilized to advantage in preheating the raw material in the remaining stages (e.g., stages **5** and **3**) through which such gases pass before dispersing in surrounding atmosphere, said method comprising the steps of:

a. extracting from said flow (e.g., in flue **4**) of gases from said identified stage (e.g., **7**) a portion of such gases;

b. conducting such extracted gases to pass through a heat

exchanger (20) into which air is introduced at a temperature lower than the temperature of the extracted gases to thereby transfer heat energy to such air while discharging the extracted gases and such air from the heat exchanger (20) in separate and unmixed streams (via 21 and 24); and



c. recycling the heat energy transferred to such air from said extracted gases by delivering and introducing such heated air to the system (via 24, 14, 18 or 24, 27) at a location within the system where material feed has at least passed through said identified stage (e.g., 7) but has not yet passed out of the kiln (11).

4,071,310

INSTALLATION FOR THE MANUFACTURE OF CEMENT

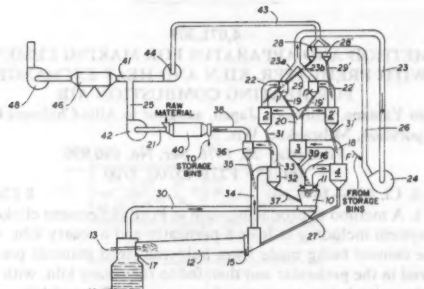
Gerard Ghestem, Lambersart, France, assignor to Fives-Cail Babcock, Paris, France

Filed Oct. 26, 1976, Ser. No. 735,908

Claims priority, application France, Oct. 28, 1975, 75 32852; Aug. 2, 1976, 76 23533

Int. Cl.² F27B 7/02

U.S. Cl. 432—106 **6 Claims**



1. An installation for the manufacture of cement from dry raw material, comprising

a. a rotary tubular kiln having

1. an inlet for the material,
2. means for producing hot gases in the kiln for converting the material into clinker,
3. an outlet for the clinker, and
4. flue means for removing the hot gases from the kiln,

b. a chamber of combustion disposed upstream of the kiln inlet, the combustion chamber having

1. means for producing combustion gases in the chamber, and
2. flue means for removing the combustion gases from the chamber,

c. first and second preheaters for the raw material,

1. said first preheater being a multi-stage preheater, and flues interconnecting the stages of the first preheater,
2. means for introducing all of the raw material into a first stage of said first preheater, for heating therein,
3. one of the stages of the first preheater being arranged to divide the heated material into two fractions,
4. conduit means passing one of the material fractions sequentially into the second preheater and into the chamber of combustion and passing the other material fraction sequentially into successive ones of the stages of the first preheater and into the chamber of combustion,
5. one of said preheaters being in communication with the flue means for removing the hot gases from the kiln whereby the hot gases pass through said one preheater for heating the material therein, and
6. the other one of said preheaters being in communication with the flue means for removing the combustion gases from the combustion chamber whereby the combustion gases pass through said other preheater for heating the material therein, and

d. a cooler receiving the clinker from the outlet of the kiln.

4,071,311

REFRACTORY INSULATION

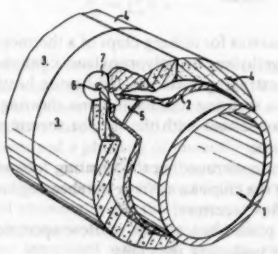
Paul Anthony Errington, Neston, England, assignor to Morgan Refractories Limited, Wirral, England

Filed May 6, 1976, Ser. No. 683,809

Claims priority, application United Kingdom, Feb. 12, 1976, 5588/76

Int. Cl.² F27D 13/06, 3/02

U.S. Cl. 432—234 **3 Claims**



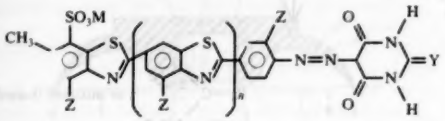
1. A furnace member comprising a generally horizontal metal pipe in a furnace and insulated by refractory sheathing consisting of metal coupling links which each rest on and fit around an upper part of the pipe, each link having substantially radially outwardly extending tile-engaging projections spaced apart around the coupling link, an inner resilient layer of refractory fibrous material covering the coupling links except for the tile-engaging projections which project through the inner layer, and an outer layer of refractory tiles which extend around and cover the inner layer, circumferentially adjacent tiles substantially meeting in abutment overlapping each coupling link and having holes engaged by said projections such that each link joins together two adjacent tiles, so that said tiles and links, with the inner layer interposed, positively interengage so as to embrace and hold in place around the pipe.

4,071,312
GREEN-YELLOW TO ORANGE MONOAZO PAPER DYES

John Blackwell, Kennett Square, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 82,119, Oct. 19, 1970, abandoned. This application Oct. 16, 1972, Ser. No. 297,957
Int. Cl.[2] D21H *1/46;* C09B *29/36*
U.S. Cl. 8—7 10 Claims

1. A green-yellow to orange fluorescent dye of the formula



where

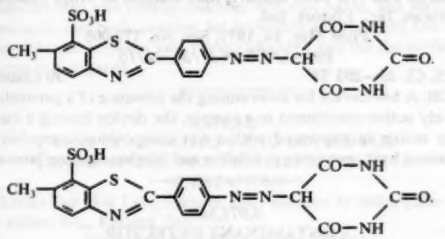
Y = O or S

Z = H or CH_3

n = 0 or 1 and

M = H, Li, Na, K, NH_4 or the protonated form of a tertiary lower alkylamine or alkanolamine.

10. The paper as claimed in claim 9 wherein the dye in its free-acid form has the structural formula



4,071,313
POLYUREA POLYCARBAMOYL SULPHONATES

Geoffrey Bruce Guise, Highton, Australia, assignor to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Filed Dec. 2, 1976, Ser. No. 746,730
Claims priority, application Australia, Dec. 5, 1975, 4204/75
Int. Cl.[2] D06M *15/52;* C08L *81/08*
U.S. Cl. 8—127.6 17 Claims

1. A composition for the treatment of fibrous materials which has the average molecular formula represented by the structure (I),

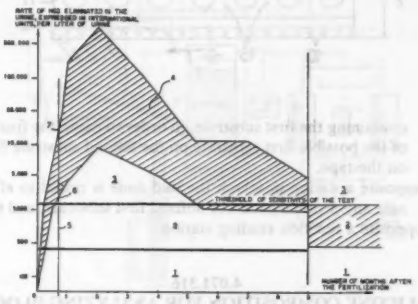
$$R(NHCONR'R'')_x(NHCOSO_3^-M^+)_y \quad (I)$$

where R is an organic radical, containing at least 6 carbon atoms; R' is an alkyl or aryl radical which may or may not contain substituents; R'' is either hydrogen or an alkyl radical; x and y are each greater than zero and $x + y \geqq 2$; M^+ is a monovalent cation or one equivalent of a polyvalent cation such that there is electrical neutrality in the molecule; and the molecular weight, as represented by the formula (I), is in excess of 500.

4,071,314
PROCESSES, REAGENTS AND MEANS FOR EARLY DIAGNOSIS OF PREGNANCY

Robert Louis Prugnaud, Paris, France, assignor to Laboratoire Theranol, Paris, France

Continuation-in-part of Ser. No. 430,935, Jan. 4, 1974, abandoned. This application June 29, 1976, Ser. No. 701,034
Claims priority, application France, Jan. 8, 1973, 73.00496
Int. Cl.[2] G01N *33/16;* A61K *37/38*
U.S. Cl. 23—230 B 9 Claims



1. In a process for early diagnosis of pregnancy in mammals for whom pregnancy causes elimination of chorionic gonadotropin of placental origin in the urine comprising:

combining a predetermined quantity and dilution of urine from a subject being tested for pregnancy with a reagent comprising a storable, dry composition mixable with diluting liquid immediately prior to usage, said composition comprising a substrate of erythrocytes or synthetic polymer suitable for use as such a substrate on which are adsorbed chorionic gonadotropin endowed with antigen properties and said composition including a substance acting as an anti-serum with respect to this antigen;

allowing the mixture to stand from one-half to 2 hours; and

inspecting the mixture for the occurrence of agglutination reaction or the inhibition thereof, the improvement wherein

the ratio of said adsorbed chorionic gonadotropin endowed with antigen properties to said substance acting as an anti-serum with respect to this hormone is such that said reagent is sensitive to chorionic gonadotropin in the urine only when the latter is eliminated in the urine at a rate exceeding 1,500 I.U. of chorionic gonadotropin per liter of urine, and the agglutination reaction is prevented when the urine contains more than 1,500 I.U. of chorionic gonadotropin per liter of urine.

and wherein said composition comprises three superimposed dried layers, the lower layer comprising said substrate having adsorbed thereon said HCG antigen, the top layer comprising said antiserum, and a middle layer interposed between said bottom and top layers, said middle layer comprising a phosphate buffer containing a calcium ion chelating agent.

4,071,315
ANALYTICAL TAPE MEDIUM

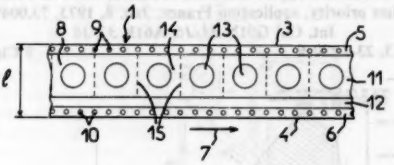
Guy Chateau, 7, rue des Ponts de Comines, Lille (Nord), France

Filed July 12, 1976, Ser. No. 704,694
Claims priority, application France, June 2, 1976, 76 17634
Int. Cl.[2] G01N *33/16, 21/30*
U.S. Cl. 23—230 B 20 Claims

1. A method for the continuous immunological analysis of a plurality of samples of serum, which consists in detecting, in each sample, the possible presence of a first substrate of antibodies or antigens by fixation of the said first substrate possibly contained in the serum on a second substrate of the corresponding antigens or antibodies respectively, wherein the

second substrate is fixed on at least one zone of a longitudinal tape and by the fact that a longitudinal translatory displacement of the tape is effected in order to bring said zone, in succession,

opposite a station where there is deposited a sample possibly



containing the first substrate, in order to cause the fixation of the possible first substrate on the second substrate fixed on the tape,

opposite a station in which the said zone is rinsed to eliminate any possible excess of unfixed first substrate, and then

opposite a reaction reading station.

4,071,316

SILICONE COMPOSITION FOR ANALYZING BLOOD SAMPLES

John H. Wright, Elnora, N.Y., assignor to General Electric Company, Waterford, N.Y.

Continuation-in-part of Ser. No. 634,563, Nov. 24, 1975, Pat. No. 4,018,564. This application Dec. 20, 1976, Ser. No. 752,057 The portion of the term of this patent subsequent to Apr. 19, 1994, has been disclaimed.

Int. Cl.[2] C07F 7/18; G01N 33/16

U.S. Cl. 23—230 B **14 Claims**

8. A method for analyzing a blood sample composed of blood serum and blood clots in part comprising adding to said blood sample a small but effective amount of blood-separating composition having controlled rheological properties and a specific gravity that varies from 1.035 to 1.06 wherein said composition comprises (a) 100 parts by weight of a blend of diorganopolysiloxanes which are compatible with each other of a viscosity varying from 10,000 to 500,000 centipoise at 24° C where the organo groups are methyl and a mixture of methyl and tetrachlorophenyl; (b) from 3 to 50 parts by weight of a filler selected from the group consisting of a fumed silica and fumed silica treated with a silicone compound wherein the amount of treated fumed silica varies from 0 to 100% by weight of the total silica present; and (c) from 0.05 to 3 parts by weight of a stabilizing compound of the formula,

$$R'O\,(C_aH_{2a}O)_x(C_bH_{2b}O)_yH$$

wherein R′ is a member selected from the group consisting of hydrogen and lower alkyl radicals having from 1 to 7 carbon atoms, *a* and *b* are integers equal to from 1 to 4 inclusive, *x* is an integer equal to from about 4 to 5 or more and *y* is a whole number equal to from 0 to 50; and centrifuging the blood sample and said blood-separating composition to separate said blood serum from said blood clost with said blood-separating composition forming an integral barrier between said blood clots and said blood serum.

4,071,317

TEST COMPOSITION AND DEVICE FOR DETERMINING PEROXIDATIVELY ACTIVE SUBSTANCES AND PROCESS FOR PREPARING SAME

Charles Tak Wai Lam, Elkhart, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Mar. 14, 1977, Ser. No. 777,002

Int. Cl.[2] G01N 31/22, 33/16

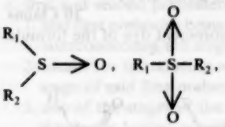
U.S. Cl. 23—253 TP **40 Claims**

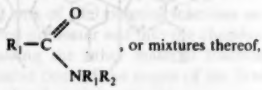
21. A test device for determining the presence of a peroxidatively active substance in a sample, the device having a carrier matrix incorporated with a test composition comprising

an organic hydroperoxide,

an indicator capable of producing a detectable response in the presence of a perioxide, and

a diluent comprising a compound having the structure





, or mixtures thereof,

in which R_1 and R_2 same or different, are hydrogen, alkyl or alkoxy having 1 to about 6 carbon atoms or aryl.

4,071,318

TEST COMPOSITION AND DEVICE FOR DETERMINING PEROXIDATIVELY ACTIVE SUBSTANCES

Charles Tak Wai Lam, Elkhart, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Mar. 14, 1977, Ser. No. 777,005

Int. Cl.[2] G01N 31/22, 33/16

U.S. Cl. 23—253 TP **30 Claims**

20. A test device for determining the presence of a peroxidatively active constituent in a sample, the device having a carrier matrix incorporated with a test composition comprising cumene hydroperoxide, o-tolidine and triethanolamine borate.

4,071,319

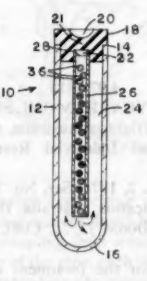
CONTAMINANT DETECTOR

Edward L. Nugent, North Caldwell, N.J., assignor to Becton, Dickinson and Company, Rutherford, N.J.

Filed Nov. 26, 1976, Ser. No. 745,101

Int. Cl.[2] G01N 31/22, 21/06, 1/24

U.S. Cl. 23—254 R **6 Claims**



1. Apparatus for the detection of fluid-borne contaminants, which comprises:

a. a first tubular container having a portal therein;

b. a self-sealing, gas-proof, cannula-penetrable closure mounted in said portal, said closure together with said first tubular container defining a hermetically sealed chamber;

c. a partial vacuum in said chamber;

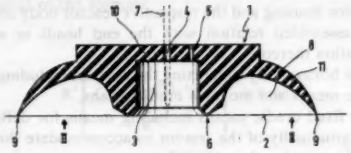
d. a second tubular container mounted in said first tubular container and having one end in open communication with said chamber and the other end closed by said closure; and

e. an indicator for the presence of said contaminants disposed in said second tubular container.

4,071,320
DEVICE FOR THE QUANTITATIVE DETERMINATION OF IMPURITIES, ESPECIALLY BACTERIA, ON FLAT SURFACES

Martin Korbin, An der Eisenbahn 1a, 6392 Neu Anspach 1, Germany

Filed Apr. 14, 1977, Ser. No. 787,387
Claims priority, application Germany, Apr. 27, 1976, 2618334
Int. Cl.[2] C12B *1/04;* G01N *1/02, 13/00*
U.S. Cl. 23—259 10 Claims



1. A device for quantitative determination of impurities, especially bacteria, on a flat surface, said device comprising a body member provided with a rinsing chamber having an opening adapted to be placed on the flat surface to be investigated in open communication therewith, aperture means spaced from said opening and connecting said rinsing chamber with the atmosphere outside said body member for permitting both liquid passage and air passage from outside said body member into said rinsing chamber and vice versa, and sealing means on said body member for providing a liquid-tight and an air-tight seal between said rinsing chamber and the flat surface being investigated.

4,071,321
TEST COMPOSITION AND DEVICE FOR DETERMINING PEROXIDATIVELY ACTIVE SUBSTANCES

Charles Tak Wai Lam, Elkhart, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.

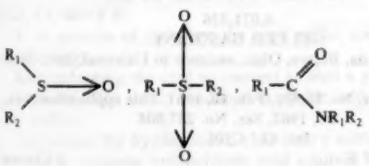
Filed Mar. 14, 1977, Ser. No. 777,001
Int. Cl.[2] G01N *31/22, 33/16*
U.S. Cl. 23—253 TP 63 Claims

51. A test device for determining the presence of a peroxidatively active substance in a test sample, said device having a carrier matrix incorporated with a test composition comprising

a. an organic hydroperoxide,

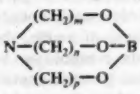
b. an indicator capable of producing a detectable response in the presence of said hydroperoxide and a peroxidatively active substance,

c. a diluent having the structure



or mixtures thereof, in which R_1 and R_2, same or different, are hydrogen, alkyl or alkoxy having 1 to about 6 carbon atoms, or aryl, and

d. a borate ester having the structure

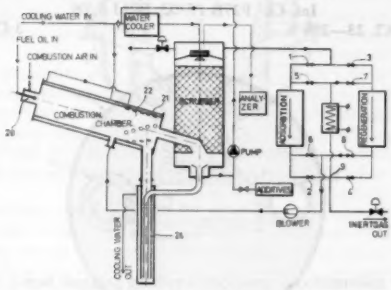


in which *m, n* and *p,* same or different, are integers of 1 to about 4.

4,071,322
APPARATUS FOR PRODUCING AN INERT GAS

Johannes W. Graat, Overasselt, Netherlands, assignor to Smit Nijmegen B.V., Nymegen, Netherlands

Continuation of Ser. No. 487,424, July 10, 1974, abandoned.
This application May 3, 1976, Ser. No. 682,546
Claims priority, application Germany, May 16, 1974, 2424064; May 16, 1974, 7417281[U]
Int. Cl.[2] B01J *1/00, 7/00;* F23D *11/00*
U.S. Cl. 23—262 8 Claims



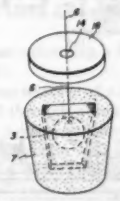
1. In an apparatus for producing an inert gas of the type wherein liquid or gaseous hydrocarbons are burnt with air, comprising:

an elongated chamber having a combustion portion including one end of the chamber and a contiguous cooling portion including the other end of the chamber, an inlet at the combustion end for receiving fuel and air to be burned and an outlet at the cooling end thereof, said chamber comprising inner and outer walls defining a water jacket therebetween along the entire length and periphery of the chamber for receiving cooling water at the combustion end, and a plurality of spray nozzles disposed along the length of the cooling portion and around the periphery thereof, said spray nozzles receptive of water from the water jacket for spraying into the cooling portion of the chamber.

4,071,323
DIFFUSION CRUCIBLE AND SLAB MEMBER WITH COMMON METAL COMPONENT IN THE VAPOR PHASE

Robert L. Holman, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 8, 1976, Ser. No. 730,918
Int. Cl.[2] B01D *9/00*
U.S. Cl. 23—273 R 8 Claims



1. A crucible and crystalline slab member for vapor phase diffusion under equilibrium conditions between the crucible and the crystalline slab member, comprising: a porous, multiphase solid crucible provided with at least one non-cylindrical cavity in which said crystalline slab member can be placed, said non-cylindrical cavity having dimensions about 1 to about 3 millimeters greater than said crystalline slab member, the said

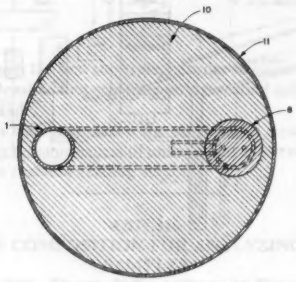
crucible and slab member comprising material which gives off the same chemical metal component in the vapor phase as said crystalline member at some temperature and whose common vapor phase is one having a pressure less than about 10^{-4} atmosphere.

4,071,324

CHEMICAL REACTOR

Luther James Reid, 196 Bishops Drive, Aston, Pa. 19014

Filed June 1, 1976, Ser. No. 691,892
Int. Cl.[2] F27B *17/02*; B01J *8/06*
U.S. Cl. 23—288 K **3 Claims**



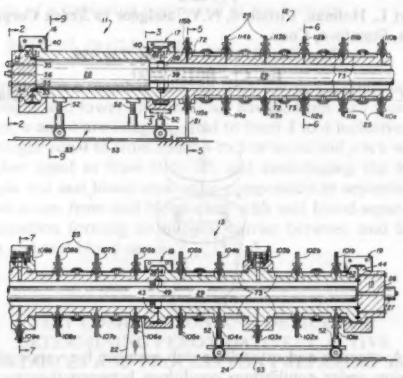
1. In an apparatus for contacting a fluid stream with a particulate solid contact material a supported heat exchange body, temperature regulating means surrounding said heat exchange body, a vertically disposed open ended tube extending through said heat exchange body, upper closure means and lower closure means for said tube, a support means attached to said lower closure and extending into said tube and a supply conduit dispsed in said heat exchange body opening into said tube above said support means and below said upper closure means.

4,071,325

ETHYLENE POLYMERIZATION REACTOR

Gerald M. Platz, West Chester, Ohio, and Norris W. Walkup, Atwood, Ill., assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed Aug. 16, 1976, Ser. No. 714,451
Int. Cl.[2] B01J *3/04*; C08F *2/00*
U.S. Cl. 23—290 **5 Claims**



1. An apparatus for the polymerization of ethylene under high pressure, which comprises:

a. an elongated reactor vessel incorporating

i. a motor housing,

ii. a first reactor body section contiguous to and in communication with the motor housing,

iii. a second reactor body section communicating with the first reactor body section,

iv. a stirrer extending longitudinally from the motor housing through the first and second reactor body sections,

v. end heads for sealing the opposite ends of the motor housing and the second reactor body section, respectively, and

vi. closure straps removably and hermetically securing the motor housing and the respective reactor body sections in assembled relation with the end heads in sealing relation thereon;

b. means horizontally supporting the reactor, including fixed cradle means and movable cradle means,

i. the fixed cradle means including means for deflecting longitudinally of the reactor to accommodate the thermal expansion thereof, and,

ii. the movable cradle means facilitating movement of the motor housing and the reactor body sections relative to one another upon disengagement of the closure straps to permit disassembly and maintenance of the reaction;

c. a plurality of fluid conduit means disposed lengthwise of the first and second reactor body sections to permit the introduction and withdrawal of fluid streams therethrough, said means being secured to a plurality of side entry means spaced longitudinally of the reactor,

i. each of said side entry means having securing means disposed circumferentially thereof for mounting the fluid conduit means to the reactor and having a plurality of apertures extending therethrough, and

ii. adjacent pairs of the apertured side entry means defining reactor jacket sections for the passage of heat transfer fluids therethrough;

d. a product outlet conduit formed at the end of the end head on the reactor body section; and

e. pressure reduction means in the product outlet conduit to permit let-down of the pressure of the product stream removed therefrom.

4,071,326

GELLED GASOLINE

George B. Freda, Belpre, Ohio, assignor to Uniroyal, Inc., New York, N.Y.

Division of Ser. No. 89,881, Feb. 16, 1961. This application Nov. 30, 1962, Ser. No. 257,804
Int. Cl.[2] C10L *7/02*
U.S. Cl. 44—7 E **2 Claims**

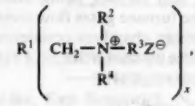
1. A gelled gasoline composition comprising gasoline containing a non-ionic wetting agent and a latex composition, the said latex composition comprising 100 parts of a rubbery polymer selected from the group consisting of polybutadiene and copolymers of butadiene with up to 50% by weight of styrene, 30–60 parts of formamide, and 5–30 parts of N-(ethylene oxide substituted) amide of oleic acid containing about 10 moles of ethylene oxide per mole of amide, the said parts being by weight, the said latex composition being present in such amount that the gelled gasoline contains from 6 to 10% by weight of rubber, based on the weight of gasoline plus latex composition, the non-ionic wetting agent being present in amount of from 0.1 to 5% based on the weight of the gasoline.

4,071,327
SALTS OF MANNICH BASES AND DERIVATIVES THEREOF

Casper John Dorer, Jr., Lyndhurst, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Continuation-in-part of Ser. No. 413,480, Nov. 7, 1973, abandoned. This application Mar. 21, 1975, Ser. No. 560,902
Int. Cl.[2] C10L *1/22*
U.S. Cl. 44—66 36 Claims

1. A composition selected from the group consisting of (1) compounds of the formula



, wherein:

R^1 is a hydroxy-substituted aromatic radical, or a hydroxy-substituted aromatic radical which contains as a further substituent an aliphatic radical;
R^2 is a hydroxy-substituted lower alkyl radical or

each of R^3 and R^7 is hydrogen or a lower alkyl or hydroxy-substituted lower alkyl radical;
R^4 is hydrogen or a lower alkyl radical;
R^5 is a lower alkylene radical;
R^6 is a hydroxy-substituted lower alkyl radical;
Z is one equivalent of an anion; and
x is the valence of R^1;
and (2) epoxide adducts of such compounds.

13. A composition comprising a major amount of a normally liquid fuel and, dissolved or substantially stably dispersed therein, a minor amount sufficient to improve dispersancy, anti-icing or rust inhibiting properties thereof of a composition according to claim 1.

4,071,328
METHOD OF REMOVING SULFUR FROM COAL

Gerard C. Sinke, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 22, 1976, Ser. No. 651,371
Int. Cl.[2] C10L *9/10;* C10B *57/00*
U.S. Cl. 44—1 R 16 Claims

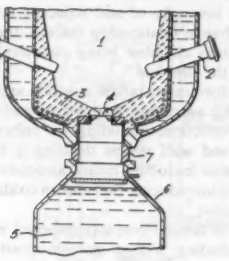
1. A process of reducing the total sulfur content of coal comprising:
hydrogenating the coal to convert at least a portion of the recoverable sulfur combined as pyritic sulfur to iron (II) sulfide;
contacting the hydrogenated coal with a sufficient amount of an aqueous hydrochloric acid solution to remove at least a portion of the sulfur combined as iron (II) sulfide.

13. A process of reducing the total sulfur content of coal comprising:
a. hydrogenating the coal under a pressure of from about 200 to about 550 pounds per square inch gauge at a temperature of from about 300° C to about 350° C for a sufficient time to convert at least a portion of the recoverable sulfur combined as pyritic sulfur to iron (II) sulfide;
b. contacting the hydrogenated coal at a temperature of from about 40° C to about 80° C with a sufficient amount of an aqueous hydrochloric acid solution to react with and thereby remove at least a portion of the sulfur combined as iron (II) sulfide.

4,071,329
COAL GASIFICATION PLANT

David Frank Eales, Kinross, Scotland, assignor to British Gas Corporation, London, England

Filed Nov. 22, 1976, Ser. No. 743,901
Claims priority, application United Kingdom, Nov. 27, 1975, 48808/75
Int. Cl.[2] B01J *3/00*
U.S. Cl. 48—62 R 14 Claims



1. In a coal slagging gasifier comprising: a column-like vessel; means for introducing coal or other carbonaceous fuel into the top of said vessel; tuyere means for introducing oxygen and steam into said vessel for gasification of fuel therein; a hearth for collecting molten slag and iron which is formed during gasification of the fuel, said hearth having a slag tap orifice for periodically discharging slag downwardly; a quenching chamber located below said slag tap orifice for quenching slag discharged through said slag tap orifice, said quenching chamber being constructed and arranged to hold a body of quenching liquid therein; a burner located within said quenching chamber for directing hot combustion products adjacent the underside of the slag tap orifice to retain the slag and iron in the hearth; and means for initiating the tapping of molten slag comprising means for stopping or reducing the burner output and means for reducing the pressure in the quenching chamber relative to that in the gasifier vessel; the improvement which comprises means for supplying a secondary supply of combustion-sustaining gas comprising at least some of the oxygen required for combustion at the burner in the quenching chamber, from a position within said quenching chamber above the level of a body of quenching liquid to be held therein and remote from the burner in said quenching chamber.

4,071,330
STEAM REFORMING PROCESS AND APPARATUS THEREFOR

Richard A. Sederquist, Newington, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 22, 1976, Ser. No. 753,341
Int. Cl.[2] C01B *2/16;* B01J *7/00*
U.S. Cl. 48—94 7 Claims

1. A process for steam reforming a hydrocarbon feedstock comprising the steps of:
introducing a vaporous mixture of a hydrocarbon feedstock and steam into and through a first steam reforming catalyst bed disposed within an annular reaction chamber positioned within a furnace, said reaction chamber being defined by inner and outer concentric, spaced apart conduits;
burning a fuel and an oxidant within said furnace to provide heat to the first catalyst bed including flowing the hot furnace gases over the outer surface of the outer conduit countercurrent to the flow of said feedstock and steam mixture flowing through the first catalyst bed, wherein the reaction products leaving the first bed include unreacted hydrocarbons heavier than methane;
passing the reaction products, without further heating, from the first catalyst bed through a second steam reforming

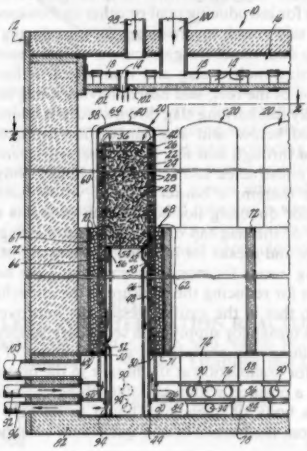
catalyst bed essentially adiabatically, the second bed being disposed within the inner conduit, wherein said unreacted hydrocarbons heavier than methane in the reaction products leaving the first bed are substantially reduced using essentially only the sensible heat within the reaction products leaving the first bed; and

returning, to the first bed, only the sensible heat in the reaction products leaving the second bed by passing the reaction products from the second bed through an annular heat regeneration chamber coaxial with said first bed and disposed inwardly of and adjacent said first bed and in heat exchange relationship thereto, the flow through the regeneration chamber being countercurrent to the flow through the first bed.

5. Steam reforming catalytic reaction apparatus comprising:

a furnace for supplying heat for an endothermic steam reforming reaction, including an enhanced heat transfer portion and wall means defining a burner cavity, said furnace also including means associated with said burner cavity for introducing fuel and an oxidant into said burner cavity;

a plurality of tubular reactors disposed within said furnace, each including a first portion positioned within said burner cavity and a second portion, said second portion being an extension of said first portion and positioned



within said enhanced heat transfer portion of said furnace, each of said reactors including inner and outer wall means defining an annular reaction chamber therebetween in heat exchange relationship to said enhanced heat transfer portion of said furnace and having a first bed of steam reforming catalyst therein, said first bed including an inlet end and an outlet end, said outlet end being disposed within said first portion of said reactor, said inner wall means defining a center tube coaxial with said reaction chamber and inwardly adjacent thereto;

said center tube including a catalyst portion and a regeneration portion, said catalyst portion having a second steam reforming catalyst bed therein, said bed including inlet means and outlet means, said reactor including means for directing reaction products from said outlet end of said first catalyst bed into said inlet end of said second catalyst bed and through said second catalyst bed, said reactor being constructed and arranged for essentially adiabatically reacting, in said second bed, the reaction products from said first bed, using only the sensible heat in the reaction products from said first bed;

cylindrical plug means disposed concentrically within said center tube and having an outer wall surface spaced inwardly from said center tube defining an annular heat regeneration chamber coaxial with and adjacent said reaction chamber and in heat exchange relationship thereto, said annular regeneration chamber having an inlet end in communication with said second bed outlet means and an outlet end adjacent said first catalyst bed inlet end, said reactor including means for directing the reaction products from said second catalyst bed outlet means into said regeneration chamber inlet end and through said regeneration chamber countercurrent to the flow through said first catalyst bed;

said furnace including heat transfer means disposed within said enhanced heat transfer portion for increasing the heat transfer effectiveness over said second portions of said reaction chambers, said furnace being constructed and arranged wherein the furnace gases flow over said second portions of said reaction chambers countercurrent to the flow through said first catalyst beds.

4,071,331

PROCESS FOR PRODUCING METHANE FROM CARBON MONOXIDE AND STEAM

Marvin M. Johnson, and Gerhard P. Nowack, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 618,722, Oct. 1, 1975, Pat. No. 4,017,424.
This application Nov. 19, 1976, Ser. No. 743,181
Int. Cl.[2] C10K *3/04*
U.S. Cl. 48—197 R **7 Claims**

1. A process for the conversion of a feed consisting essentially of carbon monoxide and steam to a gas containing methane and carbon dioxide which comprises contacting carbon monoxide and steam at an elevated temperature with a catalyst composition consisting essentially of nickel, a promoter selected from the group consisting of barium and uranium, combined oxygen and a calcium phosphate support having a Ca:P atomic ratio in the range of 1.4:1 to 2.3:1, wherein the components are present in approximate amounts as follows:

Calcium	5 to 35,
Phosphorus	2 to 20,
Nickel	10 to 50, and either
Barium	1 to 20, or
Uranium	2 to 40,

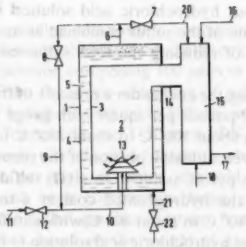
all said amounts expressed in terms of weight percent, based upon the weight of the total catalyst.

4,071,332

PROCESS OF GASIFYING SOLID FUELS, PARTICULARLY COAL

Carl Hafke, Frankfurt, and Rudolf Kohlen, Wehrheim, both of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Aug. 17, 1976, Ser. No. 715,075
Claims priority, application Germany, Feb. 26, 1976, 2607743
Int. Cl.[2] C10J *3/16*
U.S. Cl. 48—202 **3 Claims**



1. In a process of gasifying solid fuel such as coal comprising

the steps of contacting a bed of solid fuel with oxygen and water vapor under a pressure of at least about 5 bars in a reaction chamber surrounded by a water-cooled zone, the reaction heat evaporating water in said zone, transferring the water vapor from said zone to the reaction chamber, removing product gas from the reaction chamber and feeding it into a scrubber-cooler, scrubbing and cooling said product gas in the scrubber-cooler, and periodically interrupting normal gasification, the improvement which comprises discontinuing the transfer of water vapor to the reaction chamber during such periods of other than normal gasification and instead transferring the water vapor to said scrubber-cooler.

4,071,333
ABRASIVE SCOURING BLOCK (AND SUPPORT THEREFOR)

Burton M. Like, East Brunswick, N.J., assignor to American Cyanamid Company, Stamford, Conn.

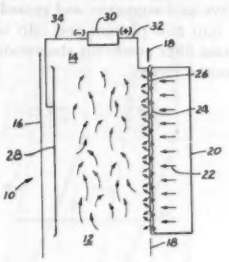
Filed Oct. 18, 1976, Ser. No. 733,647
Int. Cl.[2] C09K *3/14*
U.S. Cl. 51—304 **10 Claims**

1. A hard surface scouring block composition consisting essentially of from about 65 – 85 percent by weight of an abrasive material, from about 10 – 20 percent by weight of a high melting, non-ionic detergent, from about 5 – 15 percent by weight of a long chain fatty alcohol and up to about 10 percent by weight of an alkali metal alkyl sulfate.

4,071,334
METHOD AND APPARATUS FOR PRECIPITATING PARTICLES FROM A GASEOUS EFFLUENT

Alan C. Kolb, Solana Beach, and James E. Drummond, Coronado, both of Calif., assignors to Maxwell Laboratories, Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 502,103, Aug. 29, 1974, abandoned. This application Aug. 7, 1975, Ser. No. 602,730
Int. Cl.[2] B03C *1/00*
U.S. Cl. 55—2 **28 Claims**



1. A method of electrostatically precipitating particles from a gaseous medium carrying the same, comprising:

passing the medium through a channel in a precipitating station wherein said particles are brought into a first region containing ions of only one sign;

subjecting the medium to a supply of electrons from an electron beam generator to generate a supply of ions of both signs in a second region, said ions of one sign in said first region being supplied from said second region;

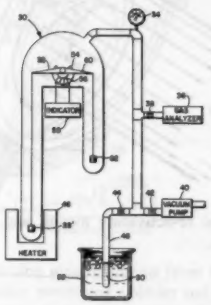
subjecting said medium to a generally uniform, strong electric field to drive said ions of one sign onto said particles, the average field strength of said electric field approaching the maximum field strength therein;

said electric field causing attraction of said charged particles to one or more electrodes having a charge of opposite polarity relative to the charged particles to thereby precipitate said particles out of the medium.

4,071,335
ZR_2NI AS A GETTER METAL AND NUCLEAR REACTOR FUEL ELEMENT EMPLOYING SUCH

Aldo Barosi, Milan, Italy, assignor to S.A.E.S. Getters S.p.A., Milan, Italy

Filed Mar. 26, 1976, Ser. No. 670,953
Claims priority, application Italy, Apr. 10, 1975, 22211/75
Int. Cl.[2] B01D *53/04, 53/26*
U.S. Cl. 55—68 **9 Claims**



1. A process for sorbing both oxygen and hydrogen from water comprising contacting the water with a getter metal consisting essentially of Zr_2Ni

wherein the partial pressure of the water is less than 100 torr;

wherein the getter metal has a temperature of 150° to 700° C;

wherein the getter metal is capable of sorbing up to 5 weight percent of water.

9. A process for sorbing both oxygen and hydrogen from water vapor present in admixture with helium in a nuclear reactor fuel element the walls of which are constructed of a zirconium alloy, said process comprising contacting the water vapor with a getter metal consisting essentially of Zr_2Ni maintained at a temperature of 200° to 500° C

wherein the partial pressure of the water is less than 100 torr;

wherein the getter metal is capable of sorbing up to 5 weight percent of water.

4,071,336
GAS AND VAPOR SEPARATOR

Anthony S. Yamine, 4679 Pardee Road, Dearborn Heights, Mich. 48125

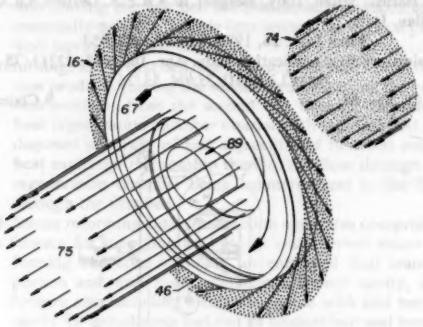
Continuation of Ser. No. 433,187, Jan. 21, 1974, abandoned. This application Dec. 1, 1975, Ser. No. 636,538
Int. Cl.[2] B01D *53/06*
U.S. Cl. 55—203 **9 Claims**

1. An apparatus for treating gases, comprising, in combination:

a rotating member including a hub member and a blade member, said blade member being attached at its innermost portion to said hub and carrying a desiccant material for absorbing absorbates of any specific gravity from incoming gases to be treated;

and power means operably connected to said hub member for rotating said rotating member at a high speed to propel axially a flow of gases purged of said absorbates and simultaneously to divert by centrifugal force radially and outwardly only said absorbates in said desiccant material to

reactivate and purge said desiccant material without any external gas-propelling means, without any desiccant



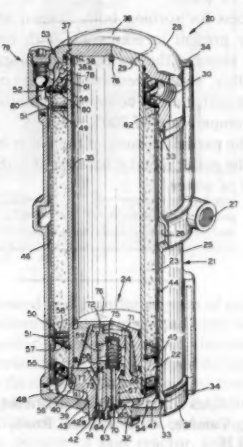
thermal re-activating means, and without any oxidizing means.

4,071,337

FILTER UNIT HAVING A CONSTANT RATE PURGING CYCLE

Bryce B. Evans, Jackson, Mich., assignor to Aeroquip Corporation, Jackson, Mich.

Filed Jan. 24, 1977, Ser. No. 761,817
Int. Cl.² B01D *53/04, 46/00*
U.S. Cl. 55—212 **9 Claims**



1. In a filtering unit for use in pressurized fluid systems of the type having an outer shell, an annular filter at the lower end of said shell, a dehydrating means thereabove, a distributing chamber at the top of said shell in communication with said filter and said dehydrating means, and a sump including a drain for exhausting said sump in the bottom of said shell, the improvement comprising:

a. a purge cylinder within said shell;

b. means for connecting said cylinder to said distributing chamber; and

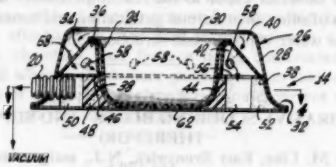
c. means in said cylinder for producing a high volume, constant velocity of air flow from said cylinder to said distributing chamber whereby said dehydrating means and said filter are backflushed by air flowing at a high volume and a constant velocity.

4,071,338

AIR EXHAUSTED MIXING BOWL

Charles G. Hutter, III, Hollywood, Calif., and Peter S. Hutter, Aspen, Colo., assignors to Physical Systems, Inc., North Hollywood, Calif.

Filed Jan. 27, 1976, Ser. No. 652,773
Int. Cl.² B01D *50/00*
U.S. Cl. 55—385 C **7 Claims**



1. Air exhausting means for a container which includes:

a housing adapted to surround the upper edge of said container, the upper edge of said housing being above the upper edge of said container;

a filter holder within said housing and adapted to surround said container, said filter holder having an annular shape and being spaced from said housing to form an annular chamber surrounding the upper edge of said container;

divider means within said filter holder dividing it into an upper plenum and a lower filter chamber, said filter holder having a first passageway establishing fluid connection between said annular chamber and said plenum, and said divider means having a second passageway therethrough establishing fluid connection between said plenum and said filter chamber;

outlet means in said filter chamber and passing out said housing adapted to be connected to exhaust means; and

absorption filter means in said filter chamber between said second passageway and said outlet means, whereby air and fumes from said container may be drawn from the space above said container and passed from said annular chamber into said plenum and into said filter chamber, through said filter means for absorption of said fumes and out said outlet means.

4,071,339

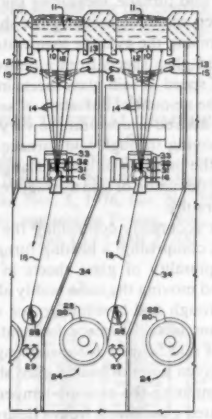
METHOD OF FORMING GLASS FIBERS

David H. Griffiths, Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 8, 1977, Ser. No. 775,483
Int. Cl.² C03B *37/02*
U.S. Cl. 65—3 R **15 Claims**

1. A method of producing glass fibers comprising attenuating a plurality of filaments from a molten glass source at a slow speed, applying a lubricant other than a binder and/or size to the filaments as they are being slowly attenuated, positioning said strand in an attenuation device, increasing the speed of attenuation until desired filament diameters are obtained, upon attaining the desired filament diameter contacting the filaments

with an application surface, applying the binder and/or size to the filaments and stopping the application of said lubricant to



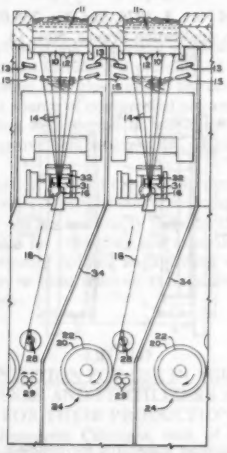
the filaments when they are in contact with the application surface.

4,071,340

APPARATUS FOR FORMING GLASS FIBERS

Carl A. Melle, Gibsonia, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 8, 1977, Ser. No. 775,481
Int. Cl.[2] C03B *37/00*
U.S. Cl. 65—11 R **9 Claims**



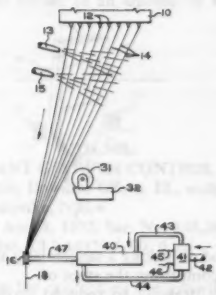
1. In an apparatus for forming glass fibers comprising a bushing having a plurality of bushing tips through which filaments are attenuated, an applicator having an application surface for applying binder and/or size to the filaments, a gathering means to combine the filaments into a unified strand and means for collecting the strand, the improvement wherein the applicator includes a movable cover having a bar which contacts the filaments, said bar being oriented to move the filaments from the application surface of the applicator when the cover is closed over the applicator during the attenuation of waste strand such that said waste strand is not coated with said binder and/or size.

4,071,341

APPARATUS FOR FORMING GLASS FIBERS

August G. Bohy, Lower Burrell, and Herbert W. Barch, Natrona Heights, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 8, 1977, Ser. No. 775,659
Int. Cl.[2] C03B *37/02*
U.S. Cl. 65—11 W **12 Claims**



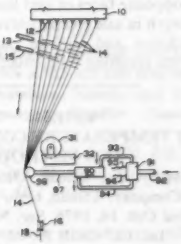
1. Apparatus for removing glass filaments from an application surface of an applicator containing a binder and/or size for coating onto said filaments during attenuation of waste filaments from a bushing comprising a gathering shoe and means connected to said gathering shoe for extending and retracting said gathering shoe from a given position, said gathering shoe being oriented with relation to said application surface such that upon extending said gathering shoe said filaments are removed from said application surface and upon retracting said gathering shoe said filaments contact said application surface.

4,071,342

APPARATUS FOR FORMING GLASS FIBERS

William L. Schaefer, Gibsonia, and Thomas J. Briar, Trafford, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 8, 1977, Ser. No. 775,482
Int. Cl.[2] C03B *37/00*
U.S. Cl. 65—11 R **11 Claims**



1. In an apparatus for forming glass fibers comprising a bushing having a plurality of bushing tips through which filaments are attenuated, an applicator having an application surface for applying binder and/or size to the filaments, a gathering means to combine the filaments into a unified strand and means for collecting the strand, the improvement comprising an extendable and retractable bar associated with the applicator for removing the filaments from the application surface of the applicator during attenuation of waste strand such that said waste strand is not coated with said binder and/or size, means for applying a lubricant other than said binder and/or size to waste filaments during attenuation of waste strand and means to coordinate the actions of said bar and said means for applying lubricant to activate said means for applying lubricant as said bar lifts said filaments from said application surface.

4,071,343

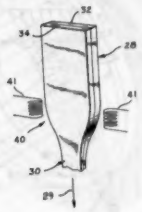
METHOD OF MAKING INTRAOCULAR LENSES

Walter P. Siegmund, Woodstock, Conn., assignor to American Optical Corporation, Southbridge, Mass.

Division of Ser. No. 667,318, March 16, 1976, Pat. No. 4,025,465. This application Nov. 26, 1976, Ser. No. 745,272

Int. Cl.[2] C03C *19/00;* C03B *11/08;* C03C *15/00*

U.S. Cl. 65—23 4 Claims



1. The method of making a tangentially apertured lens for a pseudophakos comprising the steps of:

longitudinally drawing to reduced cross-sectional size an elongated wide and relatively thin substantially flat-sided preform of lens-forming material having a rectangular cross-sectional configuration, there being a pair of spaced parallel longitudinally extending openings internally of said preform of diametral sizes and relative juxtaposition selected and arranged according to the size and spaced parallel relationships desired of said tangentially directed apertures to be produced in said lens;

cutting through the thickness of said drawn preform in a direction from one flat side thereof to the other flat side around a closed generally circular path extending over said flat sides and across said openings to produce a lens blank having edges resulting from said cutting, opposite faces of said blank comprising portions of the original flat sides of said drawn preform within said circular path, the planes of said faces being disposed substantially perpendicularly to the thickness of said edges and parallel to the directions of portions of said longitudinal openings remaining in said blank whereby said remaining openings become disposed substantially tangentially oriented in said blank each along a line joining two points on the edge of said blank; and

shaping said opposite faces of said lens blank to curvature of radii and depth in said blank determined according to the center thickness and surface curvature configurations desired of the resulting tangentially apertured lens.

4,071,344

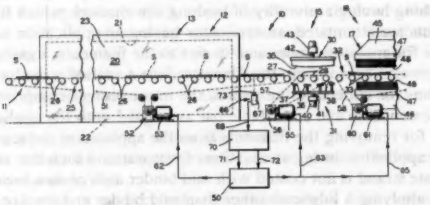
GLASS SHEET TEMPERATURE CONTROL APPARATUS AND METHOD

Richard H. Blausey, Jr., Toledo, Ohio, assignor to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Oct. 14, 1976, Ser. No. 732,319

Int. Cl.[2] C03B *23/02, 29/04*

U.S. Cl. 65—29 9 Claims



1. A method of accurately controlling the temperature of heated glass sheets comprising: supporting a plurality of glass sheets in a substantially horizontal plane and moving the same bodily in a generally horizontal path through a heating furnace at a preselected rate of speed, heating said sheets as they are advanced through said furnace, measuring the individual temperatures of a given series of heated glass sheets exiting the furnace and determining the average temperature deviation of said series of heated glass sheets from a desired temperature, varying the rate of speed of said glass sheets in said furnace in accordance with the amount of deviation of said average temperature from said desired temperature to vary the duration of time said sheets moving through said furnace are exposed to heat, and varying the duration of speed change in accordance with the amount of deviation of said average temperature from said desired temperature.

4. Apparatus for accurately controlling the temperature of heated glass sheets comprising: a heating furnace, a conveyor for supporting a plurality of glass sheets in a substantially horizontal plane and moving the same bodily along a generally horizontal path through said heating furnace at a preselected rate of speed, means in said furnace for heating said sheets, means exteriorly of said furnace for measuring the individual temperatures of a given series of heated glass sheets exiting the furnace, means computing the average temperature deviation of said series of heated glass sheets from a desired temperature, control means responsive to said average temperature deviation for generating a signal to vary the rate of speed of said conveyor to adjust the heat exposure time of said sheets moving through said furnace, and said control means including means for varying the duration of said signal in accordance with the variation in the temperature deviation.

4,071,345

APPARATUS FOR PRESS BENDING WINDOW GLASS

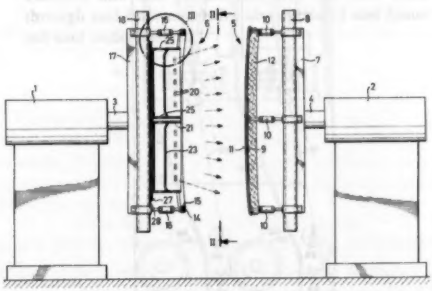
Alfons Werner; Mario Roth; Hans-Peter Siemonsen, all of Aachen, and Johann Winandi, Herzogenrath, all of Germany, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed Nov. 5, 1976, Ser. No. 739,038

Claims priority, application France, Nov. 13, 1975, 75 34574

Int. Cl.[2] C03B *23/02*

U.S. Cl. 65—273 13 Claims



1. In a glass bending apparatus for bending sheets of glass, said apparatus including a convex bending mold having a convex bending surface shaped corresponding to the desired shape of the glass for contact therewith over generally the entire surface of one side thereof, a concave bending mold disposed in opposed relation to the convex mold for pressing a sheet of glass against the convex surface, the heating means for heating said convex mold to approximately the bending temperature of the sheet of glass prior to placement of the sheet between said molds, the improvement wherein:

a. said concave mold comprises a frame for contacting only the peripheral surface of the sheet of glass to be bent during pressing of the glass against the convex surface of the opposed convex mold, the center portion of said con-

cave mold being an open space free of structure contacting the sheet of glass; and

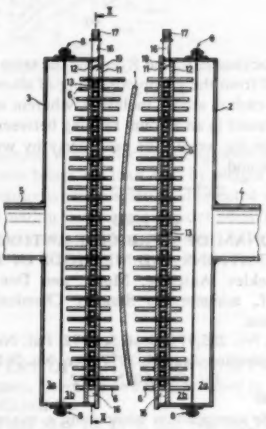
b. said heating means is disposed within the open space of the concave mold for heating the convex surface of the opposed convex mold to approximately said bending temperature.

4,071,346

APPARATUS FOR THERMAL TEMPERING SHEETS OF GLASS

Günther Schmidt, Aachen-Richterich, Germany, assignor to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed Nov. 5, 1976, Ser. No. 739,037
Claims priority, application France, Nov. 19, 1975, 75 35302
Int. Cl.[2] C03B 27/00
U.S. Cl. 65—351 **12 Claims**



1. In a compressed air tempering apparatus for sheets of glass, said apparatus including a plurality of blast nozzles for directing air against said glass, means for connecting each of said nozzles to a source of compressed air, and nozzle support means for holding said nozzles in individually adjusted axial position, the improvement wherein the nozzle support means includes:

a. hollow, flexible, inflated expandable means for engaging against the sides of each of said nozzles and with respect to which said nozzles are axially slidable; and

b. control means for expanding said expandable means laterally into pressure holding engagement with the sides of said nozzles to hold them in their individually adjusted axial positions.

4,071,347

NOVEL COMPOSITION FOR USE IN AGRICULTURE AS SOIL IMPROVERS AND FERTILIZERS AND PROCESS FOR THEIR PRODUCTION

Luigi Piccolo; Benedetto Calcagno, both of Milan; Marcello Ghirga, Bresso (Milan), and Antonio Paolinelli, Milan, all of Italy, assignors to Societa' Italiana Resine S.I.R. S.p.A., Milan, Italy

Continuation of Ser. No. 449,576, March 8, 1974, abandoned.
This application Nov. 12, 1975, Ser. No. 631,275
Claims priority, application Italy, Mar. 8, 1973, 21320/73
Int. Cl.[2] C05D 9/02
U.S. Cl. 71—31 **9 Claims**

1. A process for preparing soil improvers and fertilizers characterized in that the dry by-products obtained in the production of titanium dioxide from ilmenite or ilmenite slag in the sulfate process and which substantially consist of dry ferrous sulfate heptahydrate with minor amounts of the sulfates of magnesium, manganese, calcium, aluminum and titanium are reacted with gaseous ammonia and the reaction product obtained, consisting substantially of ammonium sulfate and ferrous hydrate, is then subsequently oxidized until a composition is obtained which substantially consists of ammonium sulfate and ferric oxide hydrate and then the product consisting substantially of ammonium sulfate and ferric oxide hydrate is treated with sulfuric acid until ferric oxide hydrate has been converted to ferric sulfate to an amount of at least 5 mole percent.

4,071,348

PLANT GROWTH CONTROL

Walter W. Abramitis, Downers Grove, Ill., assignor to Akzona Incorporated, Asheville, N.C.

Filed Apr. 5, 1973, Ser. No. 348,390
Int. Cl.[2] A01N 5/00, 9/24
U.S. Cl. 71—78 **17 Claims**

1. A composition for controlling the growth of suckers in tobacco plants, consisting essentially of:

a. from about 5% to about 50% by weight of a member of the group consisting of a monoalkyl ester of an organic dicarboxylic acid of the formula:

HOOC —X— COOR

wherein X is selected from the group consisting of —CH_2—, —CH_2CH_2—, —$CH_2CH(OH)$—, —CH=CH—, and —CHOH—, and R is alkyl having 6 to 12 carbon atoms, and the alkali metal, alkaline earth metal, ammonium, alkylammonium, and alkanolamine salts thereof;

b. from about 0.05% to about 10% by weight of a surfactant; and

c. from about 40% to about 80% of the total weight of the composition of an aliphatic alcohol having 6 to 12 carbon atoms.

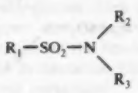
4,071,349

SULFONAMIDE HERBICIDE ANTIDOTE COMPOSITIONS AND METHODS OF USE

Duane R. Arneklev, Antelope, Mont., and Don R. Baker, Orinda, Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 285,971, Sept. 5, 1972, Pat. No. 4,021,229.
This application Jan. 24, 1977, Ser. No. 761,843
Int. Cl.[2] A01N 9/00
U.S. Cl. 71—88 **2 Claims**

1. A herbicide composition comprising a mixture of a thiocarbamate herbicide and an antidotally effective amount of an antidote compound corresponding to the formula



wherein R_1 is alkyl containing from 1 to 6 carbon atoms, inclusive; and R_2 and R_3 taken together form the ring structure alkyloxazolidyl wherein the alkyl substituents have from 1 to 4 carbon atoms, inclusive, and said alkyl substituent present as mono, di, tri or tetra substituents; wherein said antidote compound is present in an amount ranging between about 0.01 to about 15 parts by weight for each part by weight of the herbicide compound.

4,071,350

SULFONAMIDE HERBICIDE ANTIDOTE COMPOSITIONS AND METHODS OF USE

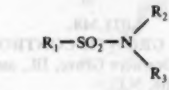
Duane R. Arneklev, Antelope, Mont., and Don R. Baker, Orinda, Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 285,971, Sept. 5, 1972, Pat. No. 4,021,229. This application Jan. 24, 1977, Ser. No. 761,830

Int. Cl.[2] A01N *9/12*

U.S. Cl. 71—100 34 Claims

1. A herbicide composition comprising a mixture of a thiocarbamate herbicide and an antidotally effective amount of an antidote compound corresponding to the formula



wherein R_1 is selected from the group consisting of phenyl, and substituted phenyl wherein said substituents can be selected from alkyl having from 1 to 4 carbon atoms, inclusive, alkoxy having from 1 to 4 carbon atoms, inclusive, halogen, nitro amino and haloalkylaminosulfonyl having from 1 to 4 carbon atoms, inclusive; R_2 and R_3 can be the same or different and are selected from the group consisting of hydrogen, alkyl containing from 1 to 6 carbon atoms, inclusive, haloalkyl containing from 1 to 6 carbon atoms, inclusive, alkoxy containing from 1 to 6 carbon atoms, inclusive, alkenyl containing from 3 to 6 carbon atoms, inclusive, alkynyl containing from 3 to 6 carbon atoms, inclusive, alkynoxycarbonyl containing from 3 to 6 carbon atoms, inclusive, carbamoyl, haloalkylthio containing from 1 to 6 carbon atoms, inclusive, phenyl, and substituted phenyl wherein said substituents can be selected from alkoxy containing from 1 to 4 carbon atoms, inclusive, halogen, hydroxy, nitro and carbamoyl, wherein said antidote compound is present in an amount ranging between about 0.01 to about 15 parts by weight for each part by weight of the herbicide compound.

4,071,351

SULFONAMIDE HERBICIDE ANTIDOTE COMPOSITIONS AND METHODS OF USE

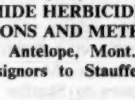
Duane R. Arneklev, Antelope, Mont., and Don R. Baker, Orinda, Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 285,971, Sept. 5, 1972, Pat. No. 4,021,229. This application Jan. 24, 1977, Ser. No. 761,837

Int. Cl.[2] A01N *9/12*

U.S. Cl. 71—100 5 Claims

1. A herbicide composition comprising a mixture of a thiocarbamate herbicide and an antidotally effective amount of an antidote compound corresponding to the formula



wherein R_1 is halogen, which includes chlorine, bromine, and fluorine; R_2 and R_3 can be the same or different and are selected from the group consisting of hydrogen, alkyl containing from 1 to 6 carbon atoms, inclusive, haloalkoxycarbonyl containing from 3 to 6 carbon atoms, inclusive and wherein halo includes, chloro, bromo and fluoro, carbamoyl, diacetonitrilocarbamoyl, wherein said antidote compound is present in an amount ranging between about 0.01 to about 15 parts by weight for each part by weight of the herbicide compound.

4,071,352

SULFONAMIDE HERBICIDE ANTIDOTE COMPOSITIONS AND METHODS OF USE

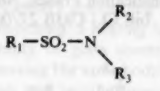
Duane R. Arneklev, Antelope, Mont., and Don R. Baker, Orinda, Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 285,971, Sept. 5, 1972, Pat. No. 4,021,229. This application Jan. 24, 1977, Ser. No. 761,838

Int. Cl.[2] A01N *9/12*

U.S. Cl. 71—100 2 Claims

1. A herbicide composition comprising a mixture of a thiocarbamate herbicide and an antidotally effective amount of an antidote compound corresponding to the formula



wherein R_1 is isocyanate; R_2 and R_3 can be the same or different and are selected from the group consisting of alkenyl containing from 3 to 6 carbon atoms, inclusive, wherein said antidote compound is present in an amount ranging between about 0.01 to about 15 parts by weight for each party by weight of the herbicide compound.

4,071,353

SULFONAMIDE HERBICIDE ANTIDOTE COMPOSITIONS AND METHODS OF USE

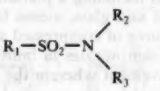
Duane R. Arneklev, Antelope, Mont., and Don R. Baker, Orinda, Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 285,971, Sept. 5, 1972, Pat. No. 4,021,229. This application Jan. 24, 1977, Ser. No. 761,840

Int. Cl.[2] A01N *9/12*

U.S. Cl. 71—100 3 Claims

1. A herbicide composition comprising a mixture of a thiocarbamate herbicide and an antidotally effective amount of an antidote compound corresponding to the formula



wherein R_1 is selected from the group consisting of alkenylamino, in which alkenyl contains from 3 to 6 carbon atoms, inclusive, and halophenylamino, in which halo includes chloro, bromo and fluoro,; R_2 and R_3 can be the same or different and are selected from the group consisting of, alkyl containing from 1 to 6 carbon atoms, inclusive, and alkenyl containing from 3 to 6 carbon atoms, inclusive, wherein said antidote compound is present in an amount ranging between about 0.01 to about 15 parts by weight for each part by weight of the herbicide compound.

4,071,354

MASTER ALLOY FOR POWDERS

Stanislaw Mocarski, Windsor, Canada, assignor to Ford Motor Company, Dearborn, Mich.

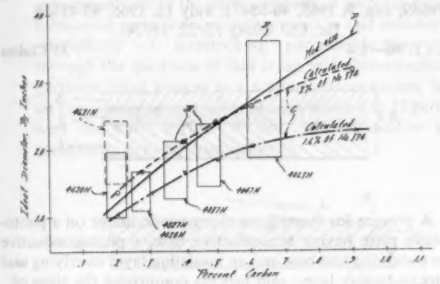
Division of Ser. No. 638,783, Dec. 8, 1975, which is a continuation-in-part of Ser. No. 535,527, Dec. 23, 1974, abandoned, which is a continuation-in-part of Ser. No. 403,240, Oct. 3, 1973, abandoned. This application July 6, 1976, Ser. No. 702,646

Int. Cl.[2] B22F *1/00*

U.S. Cl. 75—.5 R 9 Claims

1. For use in a method of making sintered alloy steel parts by the compaction and sintering of admixed powders to obtain alloying, a low melting master powder admixture of alloying ingredients to be added to an iron based powder except for the

addition of a desired quantity of graphite, the master powder admixture consisting of at least two but up to all of the powder elements selected from the group consisting of manganese, nickel, molybdenum, chromium, copper and iron, with molybdenum being in the range of 5–15% by weight of the master



powder admixture when selected along with the absence of copper, and iron being less than 20% by weight of said master powder admixture when selected, said selected elements being proportioned within said master powder admixture to possess a liquidus temperature residing between 1800°–2250° F and a melting range for all ingredients of no greater than 350° F.

4,071,355

RECOVERY OF VANADIUM FROM PIG IRON

John O. Staggers, Downingtown, Pa., assignor to Foote Mineral Company, Exton, Pa.

Filed May 13, 1976, Ser. No. 685,971
Int. Cl.[2] C21B 3/04
U.S. Cl. 75—30 **5 Claims**

1. A process for the production of a slag having a high weight ratio of vanadium to iron which can be used without further refining in production of ferrovanadium alloys containing at least about 40% by weight of vanadium which comprises introducing below the upper surface of a bath of molten pig iron containing from about 0.5 to about 3%, by weight, of vanadium, a highly oxidizing gas at a pressure of from about 40 to about 90 psig, together with a protective fluid at a pressure from about 20 to about 45 psig to increase the life of the means through which said oxidizing gas is introduced to said bath, while maintaining said bath of molten metal at a temperature in the range of about 2600° to 2900° F., continuing the introduction of said oxidizing gas and protective fluid until the carbon content of said pig iron has been reduced to an amount in the range of from about 2 to about 0.02%, whereby the vanadium in said pig iron is oxidized preferentially as compared to iron to obtain a slag containing at least 8%, by weight, of vanadium and in which the weight ratio of vanadium to iron is at least 0.5, and separating the slag from the hot metal.

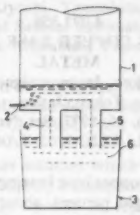
4,071,356

METHOD FOR REFINING A MOLTEN STEEL IN VACUUM

Satomi Yamamoto, and Masataka Yoshii, both of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Nov. 24, 1976, Ser. No. 744,808
Int. Cl.[2] C21C 7/10, 5/34
U.S. Cl. 75—59 **9 Claims**

1. In a method for refining molten steel in a vacuum using a R-H vacuum degassing apparatus by blowing a gas through a tuyere into the molten steel bath, the improvement which comprises blowing the gas into the bath at a position between



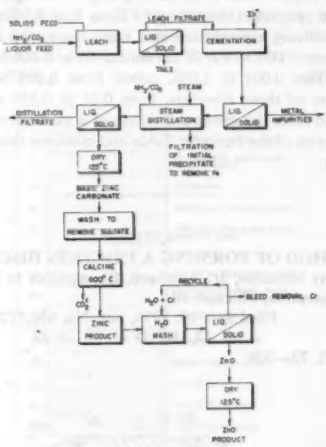
the bath surface and a depth of 50 cm from the bath surface in a substantially horizontal direction.

4,071,357

PROCESS FOR RECOVERING ZINC FROM STEEL-MAKING FLUE DUST

Mark A. Peters, Arvada, Colo., assignor to Hazen Research, Inc., Denver, Colo.

Filed Sept. 23, 1976, Ser. No. 725,929
Int. Cl.[2] C22B 19/24
U.S. Cl. 75—103 **5 Claims**



1. A process for recovering metal values from a steel-making flue dust containing zinc, iron, lead, copper, chromium and cadmium as impurities comprising:

a. leaching the feed material with ammonia and carbon dioxide in high concentration and filtering to produce a leach residue and a filtrate containing zinc values and the impurities;

b. cementing the leach filtrate from step (a) with zinc to remove lead, copper and cadmium and performing a liquid/solids separation on the resulting slurry;

c. steam distilling the cementation filtrate from step (b) to precipitate basic zinc carbonate;

d. performing an initial liquid/solids separation on the steam distillation slurry of step (c) immediately after steam distillation has begun to scavenge out the iron content of the slurry and then continuing the steam distillation until all of the zinc has precipitated as zinc carbonate;

e. calcining the zinc carbonate precipitate of step (d) at a temperature between 200° C–1100° C to convert the zinc carbonate to zinc oxide; and

f. washing the zinc oxide product of step (e) in water to

remove sulfate and chromium converted to the soluble form by the calcination of step (e).

4,071,358

HEAT RESISTING COPPER BASE BRAZING FILLER METAL

Ichiro Kawakatsu, Tokyo, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Feb. 16, 1977, Ser. No. 769,097
Int. Cl.[2] C22C *9/05, 9/06, 9/02*
U.S. Cl. 75—154 **3 Claims**

1. A heat resisting copper base brazing filler metal consisting essentially of by weight percent, about 10 to 20 manganese, about 2 to 10 nickel, about 0.5 to 4.0 tin, about 0.5 to 4.0 indium and balance copper.

4,071,359

COPPER BASE ALLOYS

Harvey P. Cheskis; Stanley Shapiro, both of New Haven, and Jacob Crane, Woodbridge, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Mar. 31, 1976, Ser. No. 672,130
Int. Cl.[2] C22C *9/01*
U.S. Cl. 75—160 **10 Claims**

1. A copper base alloy having improved high temperature rupture properties consisting of from 2 to 9.5% aluminum, a grain refining element selected from the group consisting of iron from 0.001 to 5.0%, chromium from 0.001 to 1%, zirconium from 0.001 to 1.0%, cobalt from **0.001** to 5.0%, and mixtures of these elements, from 0.01 to 0.5% of a material selected from the group consisting of a material of the lanthanide series of the Periodic Table and mixtures thereof, balance copper.

4,071,360

METHOD OF FORMING A FRICTION DISC MEMBER

Anthony Mannino, Jr., Lombard, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Jan. 19, 1976, Ser. No. 650,572
Int. Cl.[2] B21D *31/02, 28/22*
U.S. Cl. 72—329 **1 Claim**

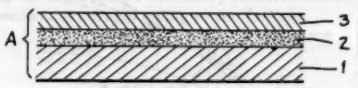
1. The method of forming a friction disc member having circumferentially spaced teeth including pairs of spaced load bearing edge portions, including the steps of shearing excess material from a piece of sheet metal stock to define said disc member confining said disc member within a die cavity having wall portions adjacent said load bearing edge portions of said teeth, urging a shedder having a pattern of projections formed thereon into penetrating engagement with planar surfaces of said teeth between pairs of edge portions thereby spreading said pairs of edge portions on each tooth into engagement with said adjacent wall portions of said die cavity to form properly sized teeth with pairs of spaced, smooth load bearing edge faces, and moving said shedder with respect to said die cavity for ejecting said disc member from said die cavity.

4,071,361

ELECTROPHOTOGRAPHIC PROCESS AND APPARATUS

Giichi Marushima, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed July 8, 1966, Ser. No. 563,899
Claims priority, application Japan, Feb. 23, 1966, 41-10915; Dec. 1, 1965, 40-73379; Oct. 28, 1965, 40-65784; Dec. 24, 1965, 40-79869; Jan. 9, 1965, 40-53471; July 12, 1965, 40-41639
Int. Cl.[2] G03Q *13/22, 13/24*
U.S. Cl. 96—1.4 **33 Claims**



1. A process for forming an electrostatic image on a photosensitive plate having a conductive base, a photoconductive layer overlying said base and an insulating layer overlying said photoconductive layer, said process comprising the steps of:
   a. applying a first charge substantially uniformly onto said insulating layer,
   b. exposing said photoconductive layer to a pattern of image light while applying a charge of a polarity opposite to that of said first charge onto said insulating layer, and then,
   c. uniformly exposing said photoconductive layer to light to which said photoconductive layer is sensitive.

4,071,362

ELECTROPHOTOGRAPHIC COPYING FILM

Haruo Takenaka; Toshiaki Okiyama, and Toshio Kawamata, all of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Jan. 5, 1973, Ser. No. 321,474
Int. Cl.[2] G03G *5/02*
U.S. Cl. 96—1.4 **15 Claims**

1. An electrophotographic process comprising the steps of forming a toner image on a recording layer;
   transferring said toner image to a copy film comprising a plastic film support having a thermal resistance withstanding temperatures of 100° C or more having coated on the surface thereof a coating layer formed of resins with contain a copolymer of at least 10% by weight of styrene with correspondingly at most 90% by weight of a comonomer selected from the group consisting of acrylic and methacrylic esters, said coating layer containing 0.1 to 10% by weight, based on the weight of copolymer, of one or more matting agents, said toner image being transferred to said coating layer of said film thereby enhancing the bonding compatibility for the toner, increasing the optical density of the transferred toner image, and decreasing the tendency for the films to be double fed.

4,071,363

METHOD OF MAKING COMPOSITE XEROGRAPHIC PHOTORECEPTOR WITH INJECTING CONTACT LAYER FOR A PHOTOCONDUCTIVE LAYER

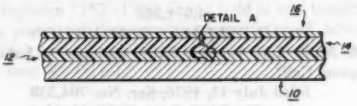
Robert N. Jones, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 566,456, April 9, 1975, Pat. No. 4,015,985.
This application June 22, 1976, Ser. No. 698,640
Int. Cl.[2] G03G *5/05*
U.S. Cl. 96—1.5 R **1 Claim**

1. A method for joining a photoconductive layer and a base layer along a charge carrier injecting interface between said photoconductive layer and said base layer comprising:
   a. forming an intermediate layer on said base layer, said intermediate layer being adhered to said base layer, said intermediate layer comprising an electrically insulating organic resin binder having uniformly dispersed therein

from 25 to 99 percent by volume based on the volume of said intermediate layer of conductive particles selected from the group consisting of silver, gold, platinum, copper and brass ranging in size from 0.1 to 5.0 microns;

b. superimposing on said intermediate layer a photoconductive layer comprising a matrix containing therein photoconductive particles from 0.01 to 1.0 micron in size, with substantially all of the photoconductive particles being in substantial particle-to-particle contact in said member in a multiplicity of interlocking photoconductive paths through the thickness of said layer, said photoconductive particles being present in a volume concentration, based on the volume of said layer, of from about 1 to 25 percent, with the outer surface of said photoconductive layer comprising organic resin material;



c. heating said intermediate layer and said photoconductive layer simultaneously and sufficiently to cause fusion of said intermediate layer and said photoconductive layer along an interface between said intermediate layer and said photoconductive layer with at least a portion of said photoconductive particles in said photoconductive layer contacting at least a portion of said conductive particles in said intermediate layer, said conductive particles having available charge carriers at suitable energy levels whereby said photoconductive particles to conductive particles contact points constitute individual charge carrier injecting contact points; and

d. cooling the heated layers to solidify said matrix material in said layers.

4,071,364
PROCESS OF PHOTOETCHING A METAL COMB

William Frederick Clark, 67 Arkley Road, Walthamstow, London E. 17; Philip Noel Baxendale, 19 Melville Road, Edgbaston, Birmingham B16 9LN, and Michael Noel Peters, 60 Cromwell Road, Southend-on-Sea, Essex, SS2 5NQ, all of England

Continuation of Ser. No. 499,071, Aug. 20, 1974, abandoned. This application Oct. 30, 1975, Ser. No. 627,034

Claims priority, application United Kingdom, Aug. 22, 1973, 39873/73

Int. Cl.² G03C *5/00*

U.S. Cl. 96—36 **5 Claims**

1. A process for producing a metal comb for use in a musical movement, wherein the process comprises the steps of preparing duplicate photographic negatives of the desired shape of the comb, covering both sides of a sheet of the metal from which the comb is to be formed by a resist, positioning said photographic negatives in accurate alignment with one another and in masking relationship with the resistcovered opposite sides of said sheet, hardening those parts of the resist that are in register with substantially transparent regions of said negatives, removing the negatives, removing the unhardened parts of the resist, chemically etching the areas of the metal sheet that are not protected by the remaining hardened parts of the resist to form individual teeth of the comb which are tonally accurate and require no subsequent mechanical tuning operation, and removing the hardened resist from both sides of the metal comb.

4,071,365
SILVER HALIDE EMULSION CONTAINING TWO-EQUIVALENT YELLOW DYE-FORMING COUPLER

Yasushi Usagawa; Kiyoshi Yamashita; Mamoru Nakatani; Kosaku Masuda, and Satoshi Kawakatsu, all of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Sept. 14, 1976, Ser. No. 723,163

Claims priority, application Japan, Sept. 16, 1975, 50-111872

Int. Cl.² G03C *7/00, 1/40*

U.S. Cl. 96—56.5 **10 Claims**

2. A color developer solution which contains, as a yellow dye image-forming coupler, a compound represented by the general formula A–Q, wherein A represents a yellow dye image-forming coupler residue having the active methylene group from which one hydrogen atom has been replaced and Q represents a tetrazolyl group substituted at the 5-position with hydrogen, a halogen, a cyano, an alkyl, an aralkyl, an aryl, an alkyl-amino or an arylamino group, the tetrazolyl group being attached at the 1 or 2 position, and a color developer.

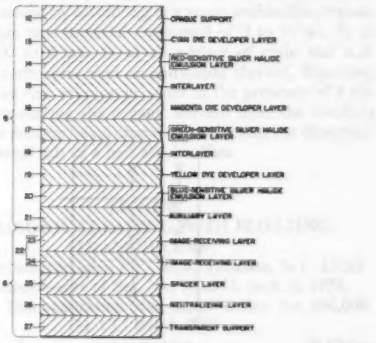
4,071,366
POLYMERIC QUATERNARY DYE IMAGE RECEIVING LAYERS WITH OVERCOAT

Gerard J. Bourgeois, Lynn, and Ronald A. Sahatjian, Bedford, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 507,339, Sept. 19, 1974, abandoned. This application July 9, 1976, Ser. No. 704,026

Int. Cl.² G03C *7/00, 1/76, 1/40, 5/54*

U.S. Cl. 96—73 **20 Claims**

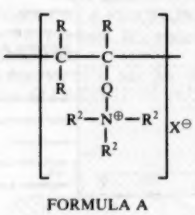


16. A photographic film unit adapted to be processed by passing the unit between a pair of juxtaposed pressure-applying members and which comprises, in combination:

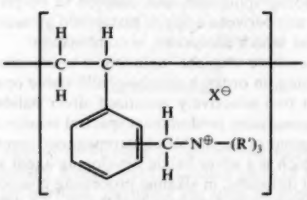
a photosensitive element including a composite structure containing, in order, a dimensionally stable opaque layer; at least two selectively sensitized silver halide emulsion layers possessing predominant spectral sensitivity to separate regions of the visible electromagnetic spectrum and a dye which is a silver halide developing agent and is soluble and diffusible, in alkaline processing composition, at a first pH associated with each of the silver halide emulsion layers and possessing a spectral absorption range subsequent to processing substantially complementary to the predominant sensitivity range of its associated emulsion layer; an alkaline solution permeable polymer layer comprising a mixture of polyacrylamide and a polyvinylpyridine; an alkali solution permeable polymeric layer comprising a polymeric mordant having quaternary nitrogen groups; a polymer layer possessing acid capacity effective to reduce alkaline processing composition possessing the first pH to a second pH at which the dyes are substantially nondiffusible; a dimensionally stable transparent layer;

and means securing the layers in substantially fixed relationship;

a rupturable container retaining an alkaline processing composition possessing the first pH and retaining substantially uniformly disposed therein titanium dioxide and an organic optical filter agent substantially non-diffusible from the processing composition and possessing a pKa below the first pH and above the second pH wherein the filter agent exhibits spectral absorption substantially complementary to the predominant sensitivity range of the selectively sensitized silver halide emulsion layers at the first pH and the titanium dioxide and filter agent are present in quantity sufficient, upon distribution of the alkaline processing composition possessing the first pH as a layer intermediate the dyeable polymeric sheet and next adjacent selectively sensitized silver halide emulsion layer, to provide to the layer an optical transmission density $> \sim 6.0$ density units with respect to incident radiation actinic to the silver halide emulsion layers and an optical reflection $< \sim 1.0$ density units with respect to incident visible radiation, and said rupturable container is positioned and extends transverse an edge of the photosensitive element to effect unidirectional discharge of the container's alkaline processing composition intermediate the polymeric layer comprising said mixture of polyacrylamide and a polyvinylpyridine and the selectively sensitized silver halide emulsion layer next adjacent; said polymeric mordant of said alkali solution permeable polymeric layer being a polymer selected from Formula A or Formula B below:



FORMULA A



FORMULA B

where each R can be the same or different substituent which does not interfere with polymerization of the vinyl group; Q is a covalent linking radical selected from the group consisting of alkylene, arylene, aralkylene or arylenealkyl; R^2 can be the same or different substituent chosen from the group consisting of alkyl or carbocyclic; each R′ can be the same or different substituent chosen from the group consisting of hydrogen, hydroxyl, alkyl, alkoxy, alkanol or at least one R′ can be carbocyclic and X^- represents an anion.

4,071,367

CHANNELED PHOTOSENSITIVE ELEMENT

John R. Collier, The Plains, Ohio, and Yvan P. Pilette, Lawrenceville, N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 527,840, Nov. 27, 1974, Pat. No. 3,984,244. This application Apr. 21, 1976, Ser. No. 678,931

Int. Cl.² G03C *1/72*

U.S. Cl. 96—79 **3 Claims**

1. A photohardenable, thermoplastic element comprising a photohardenable thermoplastic layer having a surface containing a plurality of channels with a depth of at least 0.0005 inch and at least half as deep as the thickness of the photohardenable layer while the other surface has adhered thereto with low to moderate adherence a thin, flexible, polymeric film support.

4,071,368

MOLD RELEASE COMPOSITION

John R. Jones, Los Angeles, Calif., assignor to Lubeco, Inc., Compton, Calif.

Filed July 12, 1976, Ser. No. 704,338

Int. Cl.² B28B *7/36*; C03B *39/00*

U.S. Cl. 106—38.28 **20 Claims**

1. A mold release and lubricating composition comprising an oxidation resistant solid lubricant formed of a mixture of graphite and potassium titanate; and an inorganic binder, in proportions of about 6 to about 62 parts of graphite, and about 3 to about 56 parts of potassium titanate, to 100 parts of inorganic binder, by weight.

4,071,369

METHOD OF MANUFACTURING POROUS CERAMIC PRODUCTS BY REACTING FLUE GAS DUST AND FILTER DUST WITH CLAYS OR THE LIKE, SUCH AS EXPANDED CLAY

Fredrik Wilhelm Kurz, Nysatravagen 12, Lidingo, and Hans Rudmark, Robo, Uppsala, both of Sweden

Continuation of Ser. No. 588,053, June 18, 1975, abandoned, which is a continuation-in-part of Ser. No. 235,079, March 15, 1972, abandoned. This application Nov. 11, 1976, Ser. No. 740,931

Claims priority, application Sweden, Mar. 19, 1971, 3620/71

Int. Cl.² C04B *21/00*

U.S. Cl. 106—40 R **3 Claims**

1. A method of manufacturing porous ceramic products consisting essentially of

mixing ceramic clay with

1 to 35%, based on the weight of said clay, of an amorphous fly dust having a specific surface area of at least 20 m^2/g and consisting essentially of 75–92% silica, metal oxides selected from the group consisting of MgO, Cr_2O_3, FeO, Fe_2O_3, Al_2O_3, ZnO, Ni_2O_3, TiO_2, CuO, PbO, MnO_2 and SnO_2, and a minor amount of carbon, and

heating the resulting composition to at least 800° C to convert said composition into a porous ceramic material.

4,071,370

MAGNESITE-CHROME REFRACTORY

Ben Davies, Pittsburgh, Pa., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Mar. 31, 1977, Ser. No. 783,128

Int. Cl.² C04B *35/04, 35/12*

U.S. Cl. 106—59 **13 Claims**

1. A burned basic refractory shape made from a refractory size graded brickmaking batch, said batch comprising dead burned magnesite and chrome ore, said shape having a lime dead burned magnesite and chrome ore, said shape having a lime to silica ratio between about 1.7 and 2.1 to 1 and a chromic oxide to aluminum oxide plus iron oxide ratio in excess of about 1.5 to 1.

4,071,371

HIGH TEMPERATURE CERAMIC MATERIAL SUITABLE FOR GAS TURBINE APPLICATIONS AND A PROCESS FOR PRODUCING SAME

Morton E. Milberg, Southfield, and Wayne M. Miller, Belleville, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Mar. 6, 1975, Ser. No. 556,030
Int. Cl.[2] C04B *35/58*
U.S. Cl. 106—65 2 Claims

1. A method of making ceramics, comprising:
a. compact a desired powdered shape from a mixture of 99.9% pure Si_3N_4 powder, Al_2O_3 powder, and Y_2O_3 powder, said Y_2O_3 being present in said mixture at about essentially a 3% additive by weight and said Al_2O_3 being present in an amount at about essentially 16% by weight
b. with the absence of pressure, heat said shape to a temperature between 1550°–1700° C and hold at said temperature for a period of time at about essentially 12 hours, the resulting ceramic exhibiting a transverse rupture strength of at least 80,000 psi.

4,071,372

SILICON NITRIDE NGV'S AND TURBINE BLADES

Jack Raymond Bird, Chellaston, England, assignor to The Secretary of Defence, in Her Brittanic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, United Kingdom

Continuation of Ser. No. 194,014, Oct. 29, 1971, abandoned. This application Aug. 27, 1973, Ser. No. 392,005
Claims priority, application United Kingdom, Nov. 3, 1970, 52174/70
Int. Cl.[2] C04B *35/58*
U.S. Cl. 106—73.5 7 Claims

1. A method of manufacturing a unitary article from hot pressed silicon nitride having at least two portions, each portion thereof being formed in a separate hot pressing operation, the formed article having at least two sections of differing wall thickness, the method including the steps of
a. hot pressing a first mixture of silicon nitride powder and a fluxing agent for said silicon nitride in a first mold to form a first one of the said sections,
b. placing said first section in a second mould which is adapted to accommodate both of the said sections,
c. filling the mould with a sufficient quantity of silicon nitride powder and a fluxing agent for said silicon nitride to form the second one of the said sections by not pressing the said second mixture, and
d. hot pressing said second mixture, the resultant to densify the added silicon nitride powder and fluxing agent together to form a second section, while at the same time bonding said second section to the said first section, the entire article completely densified throughout.

4,071,373

PROCESS FOR THE MANUFACTURE OF ALUMINOUS CEMENT FROM ALUMINUM SMELTING RESIDUE

Keiichi Akiyama, Tokyo, Japan, assignor to Aluminum Alloy Refiners Association, Tokyo, Japan, a part interest

Filed July 6, 1976, Ser. No. 702,648
Int. Cl.[2] C04B *7/32*
U.S. Cl. 106—104 3 Claims

1. A process for the manufacture of aluminous cement from aluminum smelting residue, which comprises the steps of:
preparing a mixture of 150 parts of aluminum smelting residue containing at least one of aluminum carbide and aluminum nitride, 50 parts of limestone, 50 parts of blast furnace slag, 50 parts of converter slag, and 30 parts of aluminum hydrosilicate;
crushing said mixture;
burning said crushed mixture to form a clinker; and powdering said clinker to form the aluminous cement.

4,071,374

FRICTION COSMETIC GEL

Abraham Minton, Rego Park, N.Y., assignor to Gripsin Industries, Inc., Elizabeth, N.J.

Filed June 23, 1975, Ser. No. 589,398
Int. Cl.[2] C08L *1/08*; C09J *3/04*
U.S. Cl. 106—189 14 Claims

1. A grip-improving gel which comprises a fine particle size hydrophobic silica, said hydrophobic silica being formed from a reaction of silica with a silane, said silane having the general formula of SiR_nX_{4-n}, wherein R comprises a lower alkyl, X comprises a halogen, and n is from 1 to 3, a minor amount of a compatible gelling agent for improving the adherence of said gel, said compatible gelling agent being selected from the group consisting of cellulose gums, hydrous magnesium and aluminum silicates, organic derivatives of the hydrous magnesium and the aluminum silicates, and mixtures thereof, and a major amount of an aqueous solution of a C_1 through C_4 alcohol, so that upon the application of said gel a thin, non-tacky, strongly adhering dry film is formed.

4,071,375

PROCESS FOR PREPARING STABLE AQUEOUS DISPERSIONS OF ROSIN-BASE MATERIAL

Shuhei Ishibe, Nara; Toshiharu Okumichi, Suita; Yasushi Ishihara, Osaka, and Hisayoshi Naka, Sakai, all of Japan, assignors to Arakawa Rinsan Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Oct. 14, 1976, Ser. No. 732,209
Claims priority, application Japan, Oct. 21, 1975, 50-127019
Int. Cl.[2] C08J *3/02*; C08L *93/00*
U.S. Cl. 106—238 14 Claims

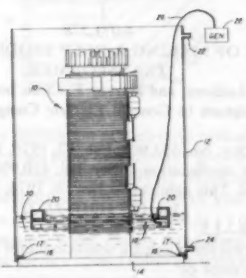
1. A process for preparing a stable aqueous dispersion of rosin-base material by dissolving in a water-immiscible organic solvent a rosin-base material composed of 0 to 95 wt. % of rosin and 100 to 5 wt. % of an adduct of rosin and α,β-unsaturated carboxylic acid or anhydride thereof, dispersing the organic solvent solution in water in the presence of a dispersant and removing the organic solvent from the resulting emulsion, the process being characterized in that the dispersant is an alkali metal salt of a half alkyl sulfate.

4,071,376

ULTRASONIC CLEANING WITH FLOATING TRANSDUCERS

Larry M. McNeer, 3 Green Fir Circle, Syracuse, N.Y. 13219

Continuation-in-part of Ser. No. 610,973, Sept. 8, 1975, abandoned. This application May 26, 1976, Ser. No. 690,000
Int. Cl.[2] B08B *3/12*
U.S. Cl. 134—1 10 Claims



1. A method of cleaning a surface comprising:
a. forming an enclosed, substantially liquid-tight chamber within which the surface to be cleaned is fully exposed;
b. attaching at least one ultrasonic transducer to floatation means capable of supporting said transducer in a liquid medium;

c. positioning said floatation means and transducer within said chamber at a vertical level at least as low as the lowest point on, and with the wave-emitting surface of said transducers facing toward said surface to be cleaned;
d. filling said chamber with a liquid medium from the lowest to the highest point to be cleaned on said surface, whereby said floatation means and transducer float from said lowest to said highest point;
e. applying power to said transducer during said filling sufficient to cause cavitation of said liquid medium, thereby cleaning said surface; and
f. draining said liquid medium from said chamber.

4,071,377
METHOD OF MECHANICAL DISHWASHING AND COMPOSITIONS

Milan Johann Schwuger, Haan; Heinz Smolka, Langenfeld; Theodor Altenschopfer, and Manfred Rostek, both of Dusseldorf, all of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA), Dusseldorf-Holthausen, Germany

Filed Apr. 5, 1974, Ser. No. 458,333

Claims priority, application Austria, May 7, 1973, 4012/73; June 29, 1973, 5757/73; Aug. 16, 1973, 7160/73; Nov. 9, 1973, 9450/73

Int. Cl.[2] A47L *15/00;* **C02B** *1/44;* **C11D** *3/12, 3/60*

U.S. Cl. 134—29 **1 Claim**

1. In the process of mechanically washing of soiled dishes by mechanically contacting soiled dishes with an alkaline aqueous solution at a pH of from 8 to 13 containing a sufficient amount of a water softening agent whereby the soil on said soiled dishes is dispersed or dissolved, rinsing said dishes with a clear rinse liquid and recovering said dishes substantially soil-free, the improvement which consists of using a composition for use in mechanical dishwashers consisting essentially of (A) 44 percent by weight on the anhydrous basis of a finely-dispersed water-insoluble aluminosilicate compound having primary particles in the size range of 100 μ to 0.1 μ, a calcium binding power of 150 mg CaO/gm of anhydrous substance when measured at 22° C by the Calcium Binding Power Test Method described in the specification and the formula

$$0.9\ Na_2O \cdot Al_2O_3 \cdot 2.05\ SiO_2 \cdot 4.3\ H_2O$$

(B) 40 percent by weight of Na_2SiO_3, (C) 2 percent by weight of the sodium or potassium salt of dichloroisocyanuric acid, (D) 1 percent by weight of a nonionic block polymer of ethylene oxide to polyoxypropylene glycol with a molecular weight of 1900 where the amount of polyethylene glycol ethers is 10% by weight and (E) 13 percent by weight of water, as said water softening agent, in such an amount that said alkaline aqueous solution contains from 3 to 5 gm per liter of said composition.

4,071,378
PROCESS OF MAKING A DEEP DIODE SOLID STATE TRANSFORMER

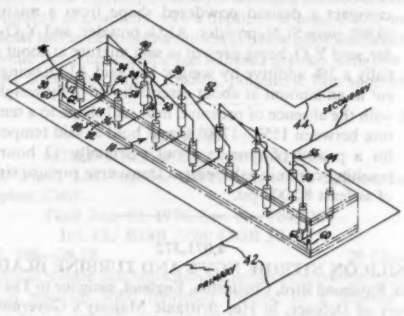
Thomas R. Anthony, and Harvey E. Cline, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 553,903, Feb. 27, 1975, Pat. No. 4,024,565, which is a continuation of Ser. No. 410,999, Oct. 30, 1973, abandoned. This application Nov. 4, 1976, Ser. No. 738,709

Int. Cl.[2] H01L *21/225*

U.S. Cl. 148—1.5 **9 Claims**

1. A process for making a semiconductor device comprising the process steps of:
a. forming a plurality of droplets of a selective metal on a selective portion of a major surface area of a body of semiconductor material having two major opposed surfaces;
b. establishing a thermal gradient substantially along an axis of the body perpendicular to the two major opposed surfaces;
c. thermal migrating the plurality of droplets of selective metal through the body in the direction of the higher temperature of the thermal gradient from the one major surface to the, and terminating in, the other of the two major opposed surfaces to form a plurality of regions of recrystallized material of the body each having two opposed end surfaces, each end surface being coextensive with only one of the two major surfaces, solid solubility of the selective metal therein and a second and opposite type conductivity than the body and also forming a P-N junction at the contiguous surfaces of each of the regions and the body;



d. affixing electrical contact means to selective end surfaces of selective regions to form a series circuit thereof to function as a primary winding of a transformer, and
e. affixing electrical contact means to selective end surfaces of the remainder of the regions to form a series circuit thereof to function as a primary winding of the same transformer.

4,071,379
PHOSPHATING METHOD

Brian Alfred Cooke, Knotty Green, and Michael Brock, Reading, both of England, assignors to Imperial Chemical Industries Limited, Great Britain

Filed Apr. 19, 1976, Ser. No. 678,426

Claims priority, application United Kingdom, Jan. 28, 1976, 3288/76

Int. Cl.[2] C23F *7/10*

U.S. Cl. 148—6.15 Z **7 Claims**

1. In a continuous process of producing a phosphate coating on a ferrous metal substrate which comprises treating the ferrous metal substrate with an acidic solution of zinc phosphate in the presence of chlorate ions, and optionally nitrate ions, the improvement which consists in adding to the solution as coating proceeds a proportion of a rapid-acting secondary oxidant for ferrous ion which is sufficient to maintain the concentration of ferrous ion at less than 112 parts per million of the solution and which is selected from alkali metal nitrites, ammonium nitrite, hydrogen peroxide, compounds containing combined hydrogen peroxide which liberate hydrogen peroxide under acid conditions, sodium hypochlorite and peroxydiacid salts, there being present in the solution when in the steady state a proportion of the secondary oxidant of from 0 to 0.6 millimoles per liter of the solution.

4,071,380
METHOD FOR TREATING OXIDIZED STEEL SURFACES

George T. Shutt, 1421 Norman Place, St. Louis, Mo. 63122

Continuation of Ser. No. 601,379, Aug. 4, 1975, abandoned. This application Sept. 2, 1976, Ser. No. 719,737
Int. Cl.[2] C23F *7/00, 7/08*
U.S. Cl. 148—6.15 R 10 Claims

1. A method for treating a corrosible steel substrate having a rusted oxidized layer thereon comprising applying to said oxidized layer a solution of a partially cured alkyl silicate wherein the alkyl group of said alkyl silicates contains 1 to 8 carbon atoms and zinc, if present, in quantities less than required to cause electrolytic action with the metal substrate, said solution being in such quantity as to saturate the oxidized layer, permitting the applied solution to cure for developing a film stably maintaining the rusted oxidized layer upon said substrate, and then applying a top coating upon said cured silicate film.

4,071,381
STEEL ABRASIVE MATERIALS

Fred J. Dunkerley, Broomall, Pa.; Albert J. Gaudino, Parma, and Robert P. Vilyus, Solon, both of Ohio, assignors to Cleveland Metal Abrasive, Inc., Cleveland, Ohio

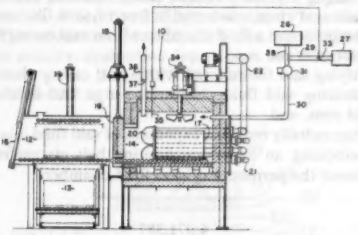
Filed Sept. 7, 1976, Ser. No. 720,596
Int. Cl.[2] C04B *35/70*
U.S. Cl. 148—36 12 Claims

1. In a refined and alloyed steel abrasive material having a composition which includes carbon in about the range of from 0.60 to 1.20 percent by weight; manganese in about the range of from 0.10 to 2.26 percent by weight; silicon in about the range of from 0.30 to 1.50 percent by weight; sulphur in about the range of from 0.0 to 0.1 percent by weight; with the remainder substantially all iron and trace elements and impurities, the improvement which comprises a substantially martensite-free microstructure, the improved material being characterized by a hardness in about the range of 20 to 47 on the Rockwell C scale and an increase in breakdown life.

4,071,382
METHOD FOR CASE HARDENING POWDERED METAL PARTS

Joseph A. Riopelle, Toledo, Ohio, assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed July 22, 1976, Ser. No. 707,843
Int. Cl.[2] B22F *3/00*
U.S. Cl. 148—126 4 Claims



1. A process for case hardening a powdered metal part having a porous, sintered body of a heat treatable steel composition comprised primarily of Fe, said process comprising the steps of:

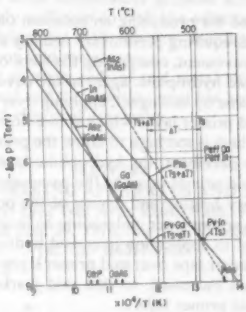
heating said part in an oxidizing atmosphere for a time period sufficient to form oxides of iron substantially filling the pores of said part at the surface of said part; and

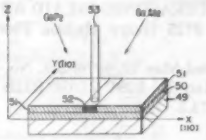
subjecting said part to a predetermined gaseous atmosphere at a predetermined temperature and time sufficient to react with said oxides of iron and said Fe to produce hardenable iron compounds.

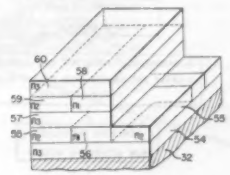
4,071,383
PROCESS FOR FABRICATION OF DIELECTRIC OPTICAL WAVEGUIDE DEVICES

Seiichi Nagata, Sakai; Tsuneo Tanaka, and Masakazu Fukai, both of Nishinomiya, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed May 11, 1976, Ser. No. 685,368
Claims priority, application Japan, May 14, 1975, 50-57638
Int. Cl.[2] H01L *21/203, 29/205*
U.S. Cl. 148—175 10 Claims





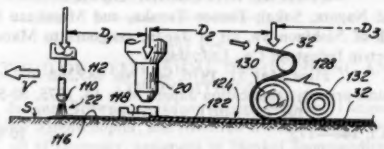


1. A process for fabrication of dielectric optical waveguide devices by utilizing thin films of epitaxially grown mixed crystals of compounds comprising applying molecular beams of elements which become the constituents of said compounds over a surface of a crystal substrate heated at a predetermined temperature in vacuum while locally irradiating a predetermined region of the surface of said substrate with concentrated energy to thereby produce epitaxial growth conditions which are different between the irradiated region and the non-irradiated region and consequently the composition of the mixed crystal grown in the irradiated region is different from the composition of the mixed crystal grown in the nonirradiated region, whereby a region having a higher refractive index is formed within a region having a lower refractive index.

4,071,384
METHOD AND DEVICES FOR ROAD SURFACE MARKING

Ludwig Eigenmann, Vacallo, Ticino, Switzerland

Continuation-in-part of Ser. No. 652,253, Jan. 26, 1976. This application Nov. 11, 1976, Ser. No. 740,850
Claims priority, application Italy, Jan. 24, 1975, 19573/75; Nov. 12, 1975, 29203/75
Int. Cl.[2] E01C 23/16
U.S. Cl. 156—71 10 Claims

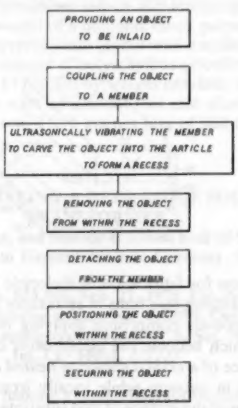


1. A method for producing an indicium on a porous pavement without requiring preliminary heating and drying of the pores of the pavement, comprising the steps of applying a thin layer of a liquid hydrophilic agent to the pavement for permeation of the same by said agent; applying over said hydrophilic layer a heated primer layer which is in a flowable state and at a viscosity which is too high to allow the primer layer itself to penetrate the pavement, the hydrophilic layer promoting the bonding of said primer layer to the pavement without requiring preliminary heating and drying of the pores of the pavement and the primer layer undergoing an increase in its viscosity subsequent to application over said hydrophilic layer; and applying a marker tape over said primer layer when the viscosity thereof has increased, so that said marker tape becomes bonded to said primer layer.

4,071,385
ULTRASONIC INLAID ARTICLE

Arthur Kuris, 3725 Henry Hudson Pkwy., Riverdale, N.Y. 10463

Filed May 19, 1976, Ser. No. 687,996
Int. Cl.[2] B29C 27/08; B32B 31/16
U.S. Cl. 156—73.1 38 Claims


PROVIDING AN OBJECT TO BE INLAID
COUPLING THE OBJECT TO A MEMBER
ULTRASONICALLY VIBRATING THE MEMBER TO CARVE THE OBJECT INTO THE ARTICLE TO FORM A RECESS
REMOVING THE OBJECT FROM WITHIN THE RECESS
DETACHING THE OBJECT FROM THE MEMBER
POSITIONING THE OBJECT WITHIN THE RECESS
SECURING THE OBJECT WITHIN THE RECESS

1. The method of forming an inlaid product, comprising the steps of:

A. carving an object having a peripheral border into an article with ultrasonic energy to form a recess having the same peripheral configuration as said border, wherein said step of carving said recess further includes the steps of:

1. coupling said object to a member adapted to be ultrasonically vibrated,
2. bringing said object adjacent the article,
3. supplying an abrasive slurry between the object and the article to cause abrading machining of the article by said object,
4. simultaneously vibrating said member when said object is urged into contact with the article, and
5. advancing the object and the article relative to each other as the abrasive progressively removes material from the article at the area of contact, whereby said recess having the same peripheral configuration as said border is formed in the article,

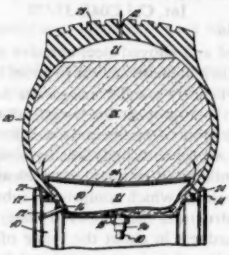
B. positioning said object within the ultrasonically carved recess in the article, and

C. securing said object within said recess, whereby said object forms the inlaid portion of the product.

4,071,386
HYBRID SOLID FILLED PNEUMATIC TIRE

Edward N. Gomberg, Tustin, Calif., assignor to Synair, Tustin, Calif.

Division of Ser. No. 514,656, Oct. 15, 1974, abandoned, and a continuation-in-part of Ser. No. 397,940, Sept. 17, 1973, abandoned. This application Feb. 25, 1976, Ser. No. 661,304
Int. Cl.[2] B29H 13/00
U.S. Cl. 156—113 2 Claims



1. The method of forming a solid fill tire and wheel assembly, said wheel having bead receiving rims and said tire including a casing having beads to be received by the wheel rims, said method comprising the steps of

mounting the tire casing upon the wheel with the casing beads seated upon the wheel rims, thereby to define a casing chamber between the wheel and the casing,

injecting into said casing chamber a liquid solidifiable fill material,

maintaining a portion of said casing chamber between said beads and rims substantially free of said fill material to thereby define a fluid chamber within said casing between said beads and rim,

solidifying said fill material within said casing chamber,

pressurizing said fluid chamber to urge said beads against said rims, and

limiting radially outward expansion of said fluid chamber by positioning an expansion limiting belt circumferentially around the periphery of said fluid chamber.

4,071,387
DECORATION OF SHEET MATERIALS

Robert J. Schlaepfer, Saint Gallen, near Lake Constance, Switzerland, assignor to Jacob Schlaepfer & Co. A.G., St. Gallen, Switzerland

Filed Sept. 18, 1975, Ser. No. 614,709
Claims priority, application United Kingdom, Sept. 19, 1974, 40872/74; Apr. 15, 1975, 15444/75
Int. Cl.[2] B44C 1/16; B32B 3/10, 7/10
U.S. Cl. 156—148 6 Claims

1. An embroidered article for application to a sheet material, comprising:

an embroidery pattern embroidered on a sheet-like substrate of thermally decomposable material, said substrate comprising on a first surface thereof a design of non-thermoplastic or high-melting thermoplastic embroidery threads defining said design, and on a second substrate surface a cooperating pattern of thermoplastic threads of a heat activatable adhesive material which becomes tacky at a predetermined temperature;

a heat stable carrier sheet adhesively and releasably adhered to said first surface;

said article being adapted to be positioned with its second surface juxtaposed the sheet material, and upon application of heat and pressure to said carrier sheet activate said adhesive to produce bonding of the embroidery pattern to the sheet material and facilitate removal of degraded particulate matter produced by heating said substrate upon stripping of said carrier sheet.

4. A method of applying embroidered designs to sheet material comprising the steps of:

forming the embroidery pattern on opposite sides of a thermally decomposable substrate from substantially oppositely disposed areas of thermoplastic and non-thermoplastic embroidery threads on the said opposite sides respectively, laminating a carrier sheet to said non-thermoplastic threads,

positioning the laminate into contact with a fabric with the thermoplastic threads juxtaposed to said fabric,

applying heat and pressure to said carrier sheet to produce decomposition of said substrate to cause said thermoplastic threads to adhere to said fabric, and

stripping the carrier sheet from the laminate to remove the degraded particulate matter produced by heating the laminate and destroying the thermoplastic threads of the embroidery design.

4,071,388

IMPULSE HEAT JOINING OF WRAPPING TAPES FOR WIRE CABLES

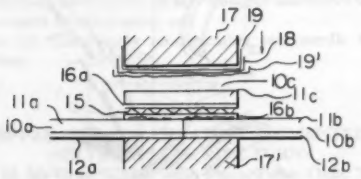
Kuniharu Usui, Fujisawa; Hiroshi Shimba, Yokohama; Kunihiro Nakagaki, Yokohama, and Hiroaki Mukunashi, Yokohama, all of Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka and Kuniharu Usui, Fujisawa, both of, Japan

Continuation of Ser. No. 527,390, Nov. 26, 1974, abandoned. This application May 20, 1976, Ser. No. 688,194

Claims priority, application Japan, Nov. 26, 1973, 48-132923

Int. Cl.[2] B29C *19/00*

U.S. Cl. 156—157 **2 Claims**



1. A method of joining end abutting metal tapes in order to continuously supply the tapes for the production of sheathed cables formed by longitudinally wrapping cable cores with the tapes, the tapes being laminated on the side remote from the cable core with a plastic film having a relatively low melting temperature, said method comprising:

placing end abutting metal tape portions on a first, relatively fixed pressing block with the film layer of said metal tapes in contact with said block,

overlying the abutting ends of said metal tape on the side opposite the plastic film with an adhesive plastic film strip having a melting temperature above that of the plastic film laminated to said metal tape,

pressing said adhesive plastic film strip against said abutting ends of said metal tape by applying under pressure a second metal block of high thermal conductivity forming a heat dissipating sink and having an electric heating element of high electrical resistance mounted to the face of the second block which immediately faces said adhesive plastic film strip with said electric heating element being electrically insulated from said second block, and

applying an electrical current pulse to said electric heating element having an amplitude and duration sufficient to establish an acute temperature gradient across the metal tape assembly sufficient to melt the adhesive plastic film strip insufficient to melt the low melting temperature plastic film on said metal tape;

whereby, said abutting ends of said metal tape portion are quickly joined and the resulting joint has high mechanical strength and electrical continuity.

4,071,389

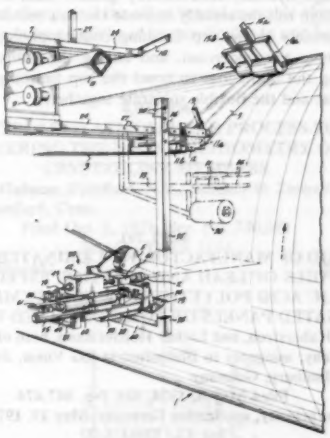
CYLINDER-MAKING APPARATUS AND METHOD

Frank Elmer Ives, 1862 Ives Ave., Kent, Wash. 98031

Filed Jan. 29, 1976, Ser. No. 653,435

Int. Cl.[2] B65H *8/00*

U.S. Cl. 156—175 **14 Claims**



1. In cylinder-making apparatus including a rotatable mandrel, resin spray means for applying settable resin on the surface of the mandrel, reinforcement supply means for supplying stranded reinforcement to be applied to the surface of the mandrel and traversing means for effecting relative movement of the resin spray means and the reinforcement supply means, on one hand, and the mandrel, on the other hand, in a direction axially of the mandrel, the improvement comprising shield means disposable in a position interposed between the resin spray means and the mandrel for blocking spray of liquid from the resin spray means onto the mandrel.

11. The method of applying settable resin onto the surface of a mandrel which comprises rotating the mandrel about its axis, traversing resin spray means axially along the mandrel while ejecting a spray of resin therefrom onto the mandrel, and turning the resin spray means while it is being traversed axially

of the mandrel about an axis extending generally parallel to the path along which resin is ejected from the resin spray means towards the mandrel to control the amount of resin applied to the mandrel by the resin spray means at a particular locations on the mandrel.

4,071,390

METHOD OF COATING FLEXIBLE SUBSTRATES WITH POLYURETHANE-POLYUREA ELASTOMERS AND PRODUCTS PRODUCED THEREBY

Albert Strassel, Oullins, France, assignor to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed July 1, 1975, Ser. No. 592,168
Claims priority, application France, July 5, 1974, 74.23417
Int. Cl.[2] B32B *31/00*
U.S. Cl. 156—239 **9 Claims**

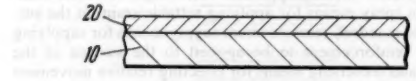
1. A method of forming a polyurethane-polyurea coating having good resistance to repeated flexing, abrasion, scratching and aging which comprises applying to a release surface a top finishing coat comprising the reaction product of an aromatic diamine with a prepolymer prepared by reacting an excess of a polyisocyanate with a polyol consisting essentially of a diol or mixture of diols; at least partially curing said finishing coat; applying on said finishing coat an undercoat comprising the reaction product of an aromatic diamine with a prepolymer prepared by reacting an excess of a polyisocyanate with a polyol consisting essentially of a polyol having a hydroxy functionality of at least 3 or a mixture of polyols having an average hydroxy functionality greater than 2 and sufficiently high to substantially increase the flex resistance of the total assembly to the top finishing coat; applying a flexible substrate to the undercoat, and curing the entire assembly including the undercoat to bond the top finishing coat, the undercoat and the flexible substrate together.

4,071,391

METHOD OF MANUFACTURING LAMINATED PANELS OR FOILS OF LEAD AND PLASTICS, ESPECIALLY ACRYLIC ACID POLYETHYLENE COPOLYMERS, AND LAMINATED PANELS OR FOILS OBTAINED THEREBY

Günter Haberstroh, and Lothar Heistermann, both of Hamburg, Germany, assignors to Bleiindustrie KG Vorm. Jung & Lindig, Hamburg, Germany

Filed May 6, 1974, Ser. No. 467,474
Claims priority, application Germany, May 19, 1973, 2325482
Int. Cl.[2] C09J *5/02*
U.S. Cl. 156—325 **2 Claims**



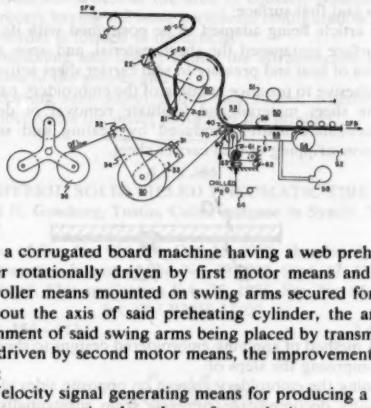
1. In a method for manufacturing a laminate of a polymeric film composed of polyethylene or polyethylene-acrylic acid copolymer and a layer of lead, consisting essentially of marrying the film and lead layer together by passing them through nip rollers, the improvement which comprises said lead layer being coated with a layer of a tin-lead alloy having a tin content in excess of 25 percent, said alloy layer being coated with a protective and adhesive film of a plasticizer for the polymeric film in a diluent prior to being married to the polymer layer.

4,071,392

AUTOMATICALLY CONTROLLED MACHINE FOR MAKING DOUBLE-FACED POLYBOARD

Partha S. Chaudhuri, Covington, Va., assignor to Westvaco Corporation, New York, N.Y.

Filed Jan. 10, 1977, Ser. No. 758,040
Int. Cl.[2] G05G *15/00*
U.S. Cl. 156—351 **9 Claims**



1. In a corrugated board machine having a web preheating cylinder rotationally driven by first motor means and wrap guide roller means mounted on swing arms secured for rotation about the axis of said preheating cylinder, the angular positionment of said swing arms being placed by transmission means driven by second motor means, the improvement comprising:

A. Velocity signal generating means for producing a signal range proportional to the surface velocity range of said preheating cylinder;

B. Feedback signal generating means for producing a signal range proportional to the angular location of said swing arms about said preheating cylinder over an arc of less than 360°, the proportional range of said feedback signal corresponding to the proportional range of said velocity signal;

C. Comparator means for receiving and comparing said velocity and feedback signals; and

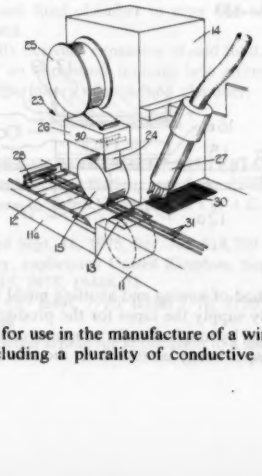
D. Logic means for emitting a second motor directional control signal according to the polarity of the difference between said velocity and feedback signals.

4,071,393

APPARATUS FOR USE IN THE MANUFACTURE OF A WIRING HARNESS

Robert Amphlett, Stoke on Trent, England, assignor to Lucas Industries Limited, England

Filed May 12, 1976, Ser. No. 685,934
Claims priority, application United Kingdom, May 23, 1975, 22536/75
Int. Cl.[2] H01B *13/00*
U.S. Cl. 156—353 **10 Claims**



1. Apparatus for use in the manufacture of a wiring harness of the kind including a plurality of conductive leads and a

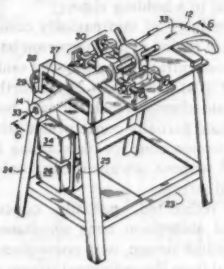
thermoplastic tape, each lead including a thermoplastic sheath containing the conductive core of the lead, the thermoplastic sheaths of the leads being fused to the thermoplastic tape to hold the leads in desired relative positions, the apparatus comprising first and second rollers between which the leads and the thermoplastic tape pass in use, whereby the rollers press the tape against the leads, means driving at least one of the rollers so that the leads and tape are driven between the rollers by rotation of the rollers, movable heater means for heating the mutually presented surfaces of the tape and the sheaths of the leads prior to their passage between the rollers whereby the pressure applied by the rollers causes the heated surfaces of the tape and sheaths of the leads to fuse together, means for moving said heater means between an operative position and a rest position wherein said heater means is spaced from said rollers, and a setable control mechanism operable at a predetermined point in the production of the harness, after a predetermined length of harness has been produced, to stop the roller drive and to return said heater means to its rest position, whereby a lead of the harness can be branched out of the harness or an additional lead can be introduced into the harness at said predetermined point in the harness.

4,071,394

APPARATUS FOR MANUFACTURING NON-WOVEN FABRIC TUBULAR FILTER

Harry Ball, Piscataway, N.J., assignor to Olympic Engineering Co., Piscataway, N.J.

Filed Mar. 18, 1977, Ser. No. 779,235
Int. Cl.[2] B29D *23/10*; D04H *18/00*
U.S. Cl. 156—465 **5 Claims**



1. Apparatus for manufacturing a tubular filter from a non-woven fabric web, comprising:
a cylindrical mandrel;
a guide sleeve coaxial with and surrounding at least a portion of the length of said mandrel;
means for drawing said web onto said mandrel between said sleeve and said mandrel to form said web into a tubular shape with the sides of said web in abutting relationship;
at least one needle having a plurality of barbed portions;
means for holding said needle in a first needling position extending transversely of said mandrel and sleeve through the space therebetween; and
means for transversely reciprocating said needle holding means.

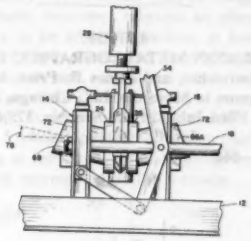
4,071,395

APPARATUS FOR CREATING SEGMENTED POLYETHYLENE PIPE TURNS

Arthur H. McElroy, 2789 E. 45th Place, Tulsa, Okla. 74105

Filed July 12, 1976, Ser. No. 704,382
Int. Cl.[2] B29C *19/00*
U.S. Cl. 156—499 **3 Claims**

1. In an apparatus for joining pipes by the fusion process, including a frame, a first clamp fixed to said frame and a movable clamp and insert jaw means in each of said clamps having circular cylindrical openings normally adapted to hold separate circular cylindrical pipes in alignment, along a horizontal axis line said movable clamp movably supported upon guide rods, said rods fixed to said frame on each side of said pipe, the axes of which lie in an imaginary plane which intersects the said horizontal axis line, the improvement comprising:
a. a first pair of insert jaws for said fixed clamp in which the circular cylindrical opening is inclined at a vertical angle A, where "A" is greater than 0° and less than 90°, to said horizontal axis line in a selected plane, through said axis line;



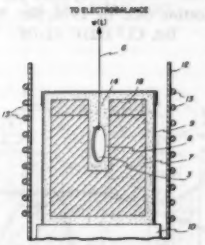
b. a second pair of insert jaws for said movable clamp in which the circular cylindrical opening is inclined at a vertical angle A to said horizontal axis line in said selected plane;
means to axially move said movable clamp towards and away from said fixed clamp, whereby two pieces of pipe can be fused together with their axes forming an angle of 2A°, each with a first face with its plane at an angle (90° − A) to the axis of the pipe, can be clamped, one in fixed clamp, and the other in said movable clamp, with their faces parallel and perpendicular to said horizontal axis line.

4,071,396

CONTROLLED ATMOSPHERE PROCESS FOR ALTERING THE NONSTOICHIOMETRY OF CRYSTALLINE MEMBERS

Robert L. Holman, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 8, 1976, Ser. No. 730,891
Int. Cl.[2] G02B *5/14*
U.S. Cl. 156—612 **20 Claims**



1. A method for altering the stoichiometry of a single phase crystalline solid, comprising:
a. placing said crystalline solid within a solid crucible having a cavity of pre-determined dimensions such that said crystalline solid is substantially symmetrically separated from the walls of said cavity in said solid crucible by a distance up to about three millimeters, said crucible comprising material which gives off the same chemical metal component in the vapor phase as said crystalline solid at a temperature, T; said chemical component in the vapor phase

having a vapor pressure less than about 10^{-4} atmosphere at said temperature T; and

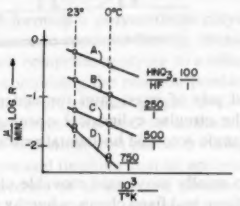
b. isothermally heating said crystalline solid and said solid crucible at said temperature T, to surround said crystalline solid with an atmosphere of substantially constant activity with respect to said chemical component in the vapor phase and within said cavity; said pre-determined dimensions of said cavity being effective to produce mass transport between said crystalline solid and said solid crucible under vapor phase equilibrium conditions.

4,071,397

SILICON METALLOGRAPHIC ETCH

Isabelle E. Estreicher, and James B. Price, both of Phoenix, Ariz., assignors to Motorola, Inc., Chicago, Ill.

Filed July 2, 1973, Ser. No. 375,403
Int. Cl.[2] H01L *21/306*
U.S. Cl. 156—662 **12 Claims**



3. In a process for use in the manufacture of MOS devices for stabilizing the threshold voltage of such a MOS device the improvement comprising the step of:

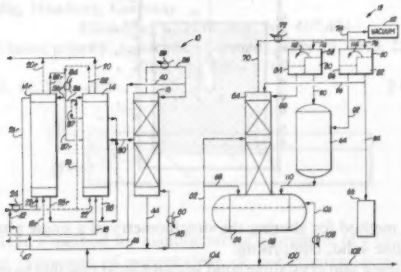
etching a lapped and polished wafer in which such MOS devices are built, in an etchant solution of a mixture of nitric acid and hydrofluoric acid having a ratio by volume of mixture lying within the range of 600:1 to 750:1 respectively.

4,071,398

CHEMICAL CONCENTRATION BY SEQUENTIAL ACTIVATED CARBON ADSORPTION AND FRACTIONATION

Kenneth W. Baierl, Appleton, Wis., assignor to Flambeau Paper Company, Park Falls, Wis.

Continuation of Ser. No. 587,850, June 18, 1975, abandoned. This application Oct. 18, 1976, Ser. No. 733,306
Int. Cl.[2] D21C *11/06*
U.S. Cl. 162—15 **12 Claims**



1. A method of continuously handling a dilute stream containing an adsorbable chemical which is continuously fed to a recovery system, and of recovering a highly purified and concentrated stream of the adsorbable chemical, said method comprising the steps of:

continuously directing said dilute stream to an adsorption zone having a plurality of adsorption columns each containing adsorption media;

continuously passing said dilute stream through one of said columns and adsorbing at least a fraction of said chemical on said media therein, thereafter diverting said dilute stream to another of said columns, and continuously passing said dilute stream therethrough for adsorption of at least a fraction of said chemical on the media within said other column;

desorbing said adsorbed chemical on the media within said one column by passing a regenerating agent through the latter during the diversion of said dilute stream to said other column whereby said one column is again capable of receiving said dilute stream and adsorbing said chemical therefrom, and producing a partially concentrated stream containing said chemical which is more concentrated than said dilute stream;

continuously directing at least a fraction of said partially concentrated stream to a second concentration zone which includes concentration apparatus usable on a batch basis, and continuously concentrating said directed fraction of the partially concentrated stream to a desired level in the second concentration zone to thereby produce a further concentrated stream of said chemical and a bottoms fraction;

collecting said bottoms fraction and recycling the same back to said adsorption zone for passage therethrough simultaneously with said dilute stream in order to readsorb any of said chemical within said bottoms fraction on said adsorption media;

continuously collecting said further concentrated stream of said chemical in a holding zone;

stopping the delivery of said partially concentrated stream for a sufficient period of time to permit batch reconcentration in the concentration apparatus of said second concentration zone of at least a part of the further concentrated stream of said chemical held in said holding zone, and redirecting said partially concentrated stream back to said first concentration zone for maintaining the continuity of said method without storage or disposal of said partially concentrated stream;

passing said redirected, partially concentrated stream through said absorption zone simultaneously with said continuous dilute stream, with consequent readsorption of said chemical from the redirected stream onto said adsorption media;

conveying at least a part of said chemical held in said holding zone back to the concentration apparatus of the second concentration zone, after said stoppage and redirection of said partially concentrated stream;

producing a finally concentrated stream of said chemical by a batch concentration of the conveyed part of said further concentrated stream in the batch concentration apparatus of the second concentration zone during said redirection and passage of said partially concentrated stream through said adsorption zone; and

recovering the finally concentrated stream of said chemical as the latter is produced by said batch concentration.

4,071,399

APPARATUS AND METHOD FOR THE DISPLACEMENT IMPREGNATION OF CELLULOSIC CHIPS MATERIAL

James R. Prough, Glens Falls, N.Y., assignor to Kamyr, Inc., Glens Falls, N.Y.

Filed Sept. 1, 1976, Ser. No. 719,656
Int. Cl.[2] D21C *3/24, 1/00, 7/06, 7/14*
U.S. Cl. 162—16 **15 Claims**

1. Apparatus for treating cellulosic chips material comprising

a. a high-pressure transfer valve for transporting cellulosic chips and liquid under pressure,

b. a high-pressure vertical treatment vessel having at least an

impregnation zone in an upper portion thereof, and a top chamber above the impregnation zone,

c. a chips and liquid inlet to said top chamber of said vessel,

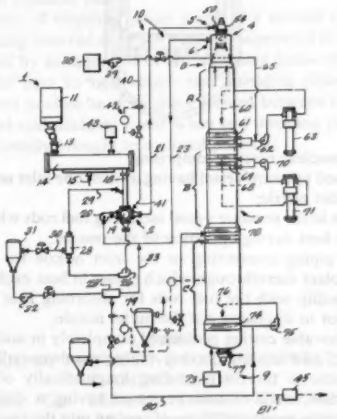
d. a feed system for feeding chips and liquid to said inlet and for returning liquid from said inlet to said high-pressure transfer valve, said feed system including conduits extending from said top chamber to said transfer valve,

e. means for establishing a countercurrent flow of digesting liquid in said impregnation zone of said vessel liquid, said means including means for withdrawing liquid from said impregnation zone through said top chamber of said vessel into said feed system,

f. means for withdrawing liquid from said feed system; so that essentially no free water enters said vessel impregnation zone,

g. means for withdrawing treated chips material from the bottom of said vessel, and

h. means for establishing a chips plug in said vessel below said inlet for isolation of said top chamber of said vessel from the impregnation zone thereof, said means for withdrawing liquid from said impregnation zone through said top chamber of said vessel including an outlet disposed above said chips plug in the top chamber of said vessel.



9. A method for treating cellulosic chips material utilizing high-pressure transfer valve connected by a feed system to at least one vertical treatment vessel having a top chamber, comprising the steps of continuously

a. feeding chips material and liquid to the high-pressure transfer valve to boost the pressure thereof,

b. transporting said high-pressure chips material and liquid to the top chamber of the vertical treatment vessel and introducing said chips into the top chamber of the vessel from the feed system, to establish a column of chips in the vessel below said top chamber of the vessel,

c. establishing a countercurrent flow of digesting liquid in the vessel impregnation zone to displace water, calcium and other minerals from the chips material, while impregnating the chips material with digesting liquid, by withdrawing liquid from said impregnation zone through said top chamber of the vessel into the feed system,

d. withdrawing liquid, including the displaced water, calcium, and other minerals, from the feed system; the withdrawals practiced in steps (c) and (d) insuring that essentially no free water enters the vessel impregnation zone, and

e. withdrawing treated chips material from the bottom of the vessel.

4,071,400

METHOD FOR CONTROLLING SOIL EROSION

Erwin M. Jankowiak, Sanford, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Apr. 5, 1976, Ser. No. 673,571

Int. Cl.² D21D *3/00*

U.S. Cl. 162—169 **6 Claims**

1. In a method for making a wind and rain resistant mat comprising the blending of plant fibers with at least 75 pounds per ton of fibers of a water resistant adhesive, consisting essentially of (1) an interpolymer of less than 60 weight percent of an alkenyl aromatic monomer wherein an alkenyl group is attached directly to an aromatic nucleus, at least 40 weight percent of an open chain conjugated diolefin having from 4 to about 9 carbon atoms, and an unsaturated carboxylic acid or anhydride (2) from about 0.5 to 2.5 weight percent based on polymer solids of a water soluble cellulose ether and (3) from about 0.70 to 2.5 weight percent of a water-soluble organo sulfonate having at least one sulfonate group attached to an aromatic ring and represented by the formula:

$$R[Ar - SO_3]M$$

wherein R is an alkyl chain having from about 8 to 20 carbon atoms, an alkenyl chain having from about 8 to 20 carbon atoms and combinations of said chains with ethoxy chains, phenyl, phenoxy, and alkyl or alkoxy substituted phenyl or phenoxy:

Ar is phenyl or naphthyl and M is an alkali metal or ammonia; distributing the coated fibers randomly into a layer, and drying the adhesive,

the improvement comprising mixing said cellulose ether with the latex containing from about 2.0 to about 25 weight percent polymer solids and then diluting the composition to the predetermined dilution level of less than about 1.0 weight percent total solids and adding the desired amount of plant fibers.

4,071,401

SEPARATING SYSTEM FOR SEPARATING TWO WIRES OF A DOUBLE-WIRE PAPER-MAKING MACHINE

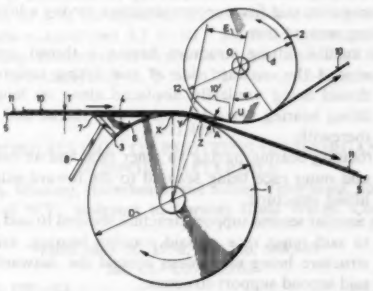
Alfred Bubik, Ravensburg; Siegfried Reutter, Gerbertshaus; Hans-Joachim Schultz, Oberhofen, and Wolf-Gunter Stotz, Ravensburg, all of Germany, assignors to Escher Wyss G.m.b.H., Ravensburg, Germany

Filed Oct. 1, 1976, Ser. No. 728,591

Claims priority, application Switzerland, Oct. 2, 1975, 12777/75

Int. Cl.² D21F *1/40*

U.S. Cl. 162—300 **12 Claims**



1. A separating system for separating two wires in a double wire paper making machine comprising

a main wire of a given thickness;

an auxiliary wire of a given thickness for conveying a paper web with said main wire in a given direction;

a main roll having a solid circumferential surface with said main wire trained thereon; and

an auxiliary roll having said auxiliary wire trained thereon; said auxiliary roll being disposed downstream of said main roll relative to said direction and being spaced from said main roll at a distance less than 0.25 times the diameter of said auxiliary roll and greater than the combined thickness of said wires and said web whereby a conveyed paper web is separated from said auxiliary wire and advanced with said main wire during operation of said system.

4,071,402

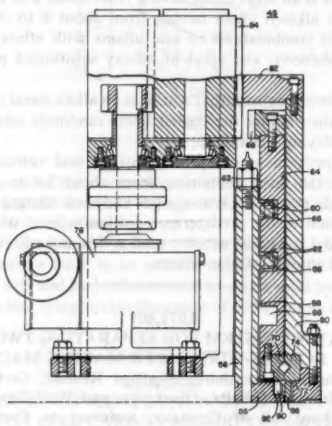
NUCLEAR REACTOR APPARATUS

Elman E. Wade, Ruffs Dale, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 540,203, Jan. 10, 1975, abandoned. This application Aug. 9, 1976, Ser. No. 712,442

Int. Cl.[2] G21C *19/22*

U.S. Cl. 176—27 **10 Claims**



1. Apparatus for independently lifting and rotating members of a nuclear reactor closure head above the nuclear reactor pressure vessel comprising:

a cylindrical first member;

a cylindrical, rotatable plug, said first member and said plug being members of said closure head;

an annular first support structure fixedly secured to said first member, said first support structure having a lifting bearing secured thereto;

an annular lifting structure having a thread continuous around the outward side of said lifting structure, said thread being vertically displaced along its length, said lifting bearing being located in said thread and engaged therewith;

a rotating bearing having an inner race and an outer race, said outer race being secured to the inward side of said lifting structure;

an annular second support structure secured to said plug and to said inner race of said rotating bearing, said lifting structure being continuous around the outward side of said second support structure;

means for driving said lifting structure;

means for rotating said second support structure; and

means for maintaining the engagement of said means for rotating said second support structure and said second support structure during vertical movement of said second support structure.

4,071,403

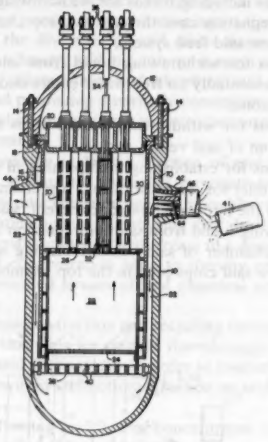
METHOD AND APPARATUS FOR PROTECTING THE CORE OF A NUCLEAR REACTOR

Harry N. Andrews, Export, and Walter G. Roman, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 1, 1974, Ser. No. 493,995

Int. Cl.[2] G21C *9/00*

U.S. Cl. 176—50 **1 Claim**



1. A nuclear reactor comprising:

a closed pressure vessel having at least one inlet nozzle an an outlet nozzle;

a core in the pressure vessel including fuel rods which generate heat during operation of the reactor;

inlet piping connecting to the inlet nozzle for supplying coolant therethrough which passes in heat exchange relationship with the fuel rods for absorbing heat therefrom prior to discharge out the outlet nozzle;

a removable casting positioned completely in said inlet nozzle, said casting having multiple substantially parallel venturies therein extending longitudinally of the inlet nozzle, each of said venturies having a design which permits unimpeded flow of coolant into the reactor during steady state reactor operation, but inhibits flow therethrough in a reverse direction upon the occurrence of a major break in the inlet piping connected to the inlet nozzle;

said venturies thereby being effective to cause said coolant to remain in contact with the fuel rods for a time sufficient to prevent said fuel rods from reaching an unacceptably high temperature.

4,071,404

RADIATION SHIELDING DEVICE FOR NUCLEAR FACILITIES

Masataka Aoki, Hitachi, Japan, assignor to Hitachi, Ltd., Japan

Filed Dec. 13, 1976, Ser. No. 749,803

Claims priority, application Japan, Dec. 22, 1975, 50-151805

Int. Cl.[2] G21E *7/00*

U.S. Cl. 176—87 **6 Claims**

1. A radiation shielding device for nuclear facilities comprising:

a vessel exposed to fissible materials;

a radiation shielding layer surrounding said vessel;

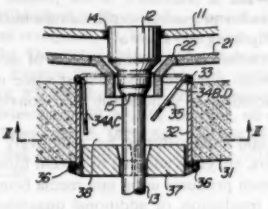
a nozzle joined at one end thereof by welding to said vessel;

a pipe joined at one end thereof by welding to the other end of said nozzle and extending through said radiation shielding layer;

a shielding frame secured to walls of an opening formed in

said radiation shielding layer to define therein a manhole, said nozzle and said pipe extending through substantially the central portion of the manhole in spaced relation with the walls of said shielding frame;

a plurality of shielding blocks made of a first radiation shielding material and each hingedly supported at one end thereof by an outer end of said shielding frame or an end thereof remote from said vessel, said shielding blocks being adapted to plug the manhole and close an open



space formed between said pipe and said shielding frame when said shielding blocks are all pivotally brought to a closed position; and

a plurality of shielding plates made of a second radiation shielding material and each hingedly supported at one end thereof by an inner end of said shielding frame or an end thereof near to said vessel, said shielding plates being adapted to close an open space formed between said nozzle and said shielding frame when said shielding plates are all pivotally brought to a closed position.

4,071,405

METHOD OF PRODUCING SULFUR CONTAINING L-AMINO ACIDS

Kenji Soda, Uji; Hidehiko Tanaka, Kyoto; Hidetsugu Nakazawa, and Koji Mitsugi, both of Yokohama, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed June 15, 1976, Ser. No. 696,398
Claims priority, application Japan, June 19, 1975, 50-73774
Int. Cl.[2] C12D *13/06*
U.S. Cl. 195—29 **6 Claims**

1. A method for the production of substituted sulfur-containing L-amino acids in which the sulfur is attached to the β- or γ-carbon atom of the amino acid, which comprises:

a. contacting a β- or γ-substituted L-amino acid in an aqueous reaction medium containing methioninase together with a sulfur containing compound to accumulate the substituted sulfur-containing L-amino acid in the medium, and

b. recovering the substituted sulfur-containing L-amino acid from the medium, the said β- or γ-substituted L-amino acid being characterized as one which is converted to pyruvic or α-keto butyric acid when held in an aqueous medium with methioninase, the said sulfur-containing compound being characterized as one which contains an active hydrogen atom and at least one unshared electron pair associated with the sulfur atom, the substituted sulfur-containing L-amino acid being characterized as one in which the original β- or γ-substitute is replaced by the entire nucleophilic moiety of the sulfur-containing compound which remains after removal of hydrogen therefrom.

4,071,406

PROCESS FOR PRODUCING XANTHOMONAS POLYSACCHARIDE ON A SOYBEAN WHEY MEDIUM

Hiroshi Kanda, Zushi, Japan, assignor to The Nisshin Oil Mills, Ltd., Tokyo, Japan

Filed July 15, 1976, Ser. No. 705,491
Claims priority, application Japan, July 15, 1975, 50-85857
Int. Cl.[2] C12D *13/04;* **C12B** *3/04, 3/14*
U.S. Cl. 195—31 P **6 Claims**

1. A process for the production of Xanthomonas Polysaccharide which comprises culturing a strain of the bacterium *Xanthomonas campestris* in a soybean whey medium and recovering the *Xanthomonas polysaccharide,* said soybean whey medium being obtained by extracting water soluble constituents from defatted soybeans with water to give an aqueous product, precipitating proteins from the resulting aqueous product at the isoelectric point with acids, removing the proteins thus precipitated to obtain a supernatant liquid, neutralizing the resulting supernatant liquid with an alkali, and then adding to the resulting soybean whey liquid an amount of glucose and/or sucrose suitable for the culture of *Xanthomonas campestris.*

4,071,407

NOVEL MALTASE ENZYME PRODUCED BY A NEW YEAST STRAIN

Leo M. Hall, Homewood, Ala., assignor to The Board of Trustees of the University of Alabama, Birmingham, Ala.

Filed Nov. 16, 1976, Ser. No. 742,240
Int. Cl.[2] C12D *13/10;* **C12K** *1/00*
U.S. Cl. 195—62 **14 Claims**

1. Maltase enzyme characterized by hydrolyzing maltotetraose only about 1/100 as fast as maltose and maltopentaose only about 1/500 as fast as maltose and prepared by growing a strain of Saccharomyces, ATCC 20,488, in a growth medium containing at least one of maltose, maltotriose or malt extract derived from a plant source, releasing the enzyme from the yeast cells, and recovering the enzyme.

4,071,408

NEURAMINIDASE

Michael Flashner, Syracuse, and Stuart W. Tanenbaum, Manlius, both of N.Y., assignors to Research Corporation, New York, N.Y.

Filed Nov. 1, 1976, Ser. No. 735,521
Int. Cl.[2] C12D *13/10*
U.S. Cl. 195—62 **13 Claims**

13. Extracellular neuraminidase derived from the microorganism *Arthrobacter sialophilum* ATCC 31253 or a neuraminidase-producing mutant or variant or derivative thereof, said neuraminidase having a molecular weight of about 87,000 daltons as measured by gel filtration chromatography, a pH optimum of 5-6, an apparent K_m of about 2.08 mg/ml for Collocalia mucoid and 3.3×10^{-3} for N-acetylneuraminlactose, being insensitive to both Ca^{++} ions and EDTA and capable of hydrolyzing (α, 2-3), (α, 2-6) or (α, 2-8) linkages.

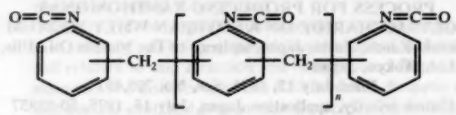
4,071,409

IMMOBILIZATION OF PROTEINS ON INORGANIC SUPPORT MATERIALS

Ralph A. Messing, Horseheads, and Sidney Yaverbaum, Suffern, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed May 20, 1976, Ser. No. 688,469
Int. Cl.[2] C07G *7/02*
U.S. Cl. 195—63 **8 Claims**

1. A method of immobilizing biologically active proteins on the surfaces of a water insoluble porous high surface area inorganic material, the method comprising the steps of reacting a high surface area inorganic material having surface hydroxyl or oxide groups with an organic solution of a polymeric isocyanate represented by the formula



where n is at least 2, said reaction resulting in inocyanate groups of the polymeric isocyanate reacting with said hyroxyl or oxide groups of said material to form a carbonate and the reaction being under conditions sufficient to form a surface of free isocyanate groups on the material, and then reacting the material with a dispersion of biologically active proteins under conditions sufficient to bond the proteins to the material in a biologically active state.

4,071,410

PROCESS FOR PREPARATION OF PANCREATIC ELASTASE

Masayuki Yoshizawa, Kawagoe, Japan, assignor to Eisai Co., Ltd., Tokyo, Japan

Filed Nov. 4, 1976, Ser. No. 738,866
Claims priority, application Japan, Nov. 8, 1975, 50-133600
Int. Cl.[2] C07G 7/026
U.S. Cl. 195—66 R **3 Claims**

1. A process for preparing pancreatic elastase, which comprises adding the duodenum of a mammalian animal or an extract thereof to pancreatic material containing a precursor of elastase to thereby activate the elastase precursor and separating pancreatic elastase.

4,071,411

ANTITUMOR ANTIBIOTICS ACLACINOMYCINS A AND B [RD-9187A]

Hamao Umezawa; Tomio Takeuchi, both of Tokyo; Masa Hamada, Hoya; Akira Takamatsu, Yokohama, and Toshikazu Oki, Kamakura, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Japan

Division of Ser. No. 596,682, July 16, 1975, Pat. No. 3,988,315. This application June 4, 1976, Ser. No. 692,827
Claims priority, application Japan, July 27, 1974, 49-86390
Int. Cl.[2] C12D 9/14
U.S. Cl. 195—80 R **21 Claims**

1. The process for producing the antitumor antibiotic aclacinomycin which comprises culturing an aclacinomycin-producing strain of *Streptomyces galilaeus* having the identifying characteristics of A.T.C.C. 31133 under submerged aerobic conditions in a nutrient medium containing a carbon source and a nitrogenous nutrient until a substantial amount of aclacinomycin is produced by said organism in said nutrient medium.

8. The process for producing the antitumor antibiotic aclacinomycin A which comprises culturing an aclacinomycin A-producing strain of *Streptomyces galilaeus* having the identifying characteristics of A.T.C.C. 31133 under submerged aerobic conditions in a nutrient medium containing a carbon source and a nitrogenous nutrient until a substantial amount of aclacinomycin A is produced by said organism in said nutrient medium.

15. The process for producing the antitumor antibiotic aclacinomycin B which comprises an aclacinomycin B-producing strain of *Streptomyces galilaeus* having the identifying characteristics of A.T.C.C. 31133 under submerged aerobic conditions in a nutrient medium containing a carbon source and a nitrogenous nutrient until a substantial amount of aclacinomycin B is produced by said organism in said nutrient medium.

4,071,412

READY MADE STERILIZED CULTURE MEDIA AND PROCESS OF PREPARATION

Eli Eisenberg, Tel-Aviv; Gideon Altmann, Petah Tiqua; Bianca Bogokovsky, Tel-Hashomer, and Mordechai Lapidot, Bne Braq, all of Israel, assignors to The State of Israel and Isorad Isotope and Radiation Enterprise, Ltd., Israel

Filed May 5, 1975, Ser. No. 574,644
Claims priority, application Israel, May 17, 1974, 44853
Int. Cl.[2] C12K 1/10
U.S. Cl. 195—102 **10 Claims**

1. A process for preparing sterile culture media in unit dosage form comprising the steps of:

preparing culture media compositions of several different conventional constitutions, at least some of said culture media including an indicator in their conventional constitutions;

adjusting said compositions by selectively adding radio protectors, enzymes adapted to pevent formation of toxic degradation products upon said media being subjected to ionizing irradiation, or additional quantities of indicator, said indicator being added only to those compositions of said conventional constitutions normally including an indicator; and

sterilizing the culture media by means of ionizing irradiation, the amount of said added constituents being such that after said sterilization step of each of said compositions a sterile culture medium of quality sufficient to produce satisfactory bacterial growth as compared to non ionizing radiation sterilized medium is obtained.

4,071,413

METHOD FOR DETERMINING FREE FATTY ACIDS IN BLOOD SERUM USING FATTY ACID ACTIVATING ENZYMES

Zyuro Takahashi, Itami, and Chozo Hayashi, Nishinomiya, both of Japan, assignors to Ono Pharmaceutical Co., Ltd., Osaka, Japan

Filed Apr. 30, 1976, Ser. No. 681,941
Claims priority, application Japan, July 30, 1975, 50-92134
Int. Cl.[2] G01N 31/14
U.S. Cl. 195—103.5 R **12 Claims**

1. A method for determining free fatty acids in blood serum, which comprises (A) preparing a standard curve for determining free fatty acids by subjecting known amounts of free fatty acid to (I) reaction with an acyl coenzyme A-synthesizing enzyme in the presence of adenosine triphosphate and coenzyme A, (2) subjecting the resulting adenosine monophosphate to reaction with myokinase in the presence of adenosine triphosphate, (3) subjecting the resulting adenosine diphosphate to reaction with pyruvate kinase in the presence of phosphoenolpyruvic acid, and (4) measuring the amount of the resulting pyruvic acid; (B) carrying out said reactions (1) through (4) in the blood serum in the absence of the coenzyme A in said reaction (I); (C) after step (B) carrying out said reactions (1) through (4) in the blood serum with the addition of coenzyme A in said reaction (I); and (D) determining amount of free fatty acids in said blood serum by subtracting the value determined in step (B) from the value determined in step (C) and comparing the result with the standard curve.

4,071,414

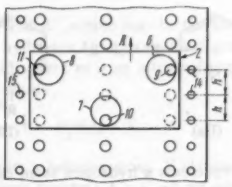
METHOD OF SMOKELESS CHARGING OF COKE OVENS WITH COAL CHARGE AND COAL-CHARGING MACHINE FOR EFFECTING SAME

Leonid Nikolaevich Fidchunov, pereulok Traktorostroitelei 85, kv. 205; Stanislav Sergeevich Balyk, ulitsa Potebni, 8, kv. 7; Adolf Nikolaevich Silka, ulitsa Kostomarovskaya, 5/7, kv. 15; Nikolai Konstantinovich Kulakov, ulitsa Danilevskogo, 14a, kv. 21, all of Kharkov; Leonid Fedorovich Bakhtarov, ulitsa Nevskogo, 5, kv. 9, Lipetsk; Alexandr Abramovich Azimov, Donetskoi oblasti, bulvar Pushkina, 3, kv. 60, Slavyansk; Vladimir Mikhailovich Davydenko, Donetskoi oblasti, ulitsa Oktyabrskoi revoljutsii, 47, kv. 5, Slavyansk; Nikolai Vasilievich Balitsky, Donetskoi oblasti, ulitsa Bulvarnaya, 7, kv. 21, Slavyansk; Evgeny Petrovich Likhogub, ulitsa Kommunalnaya, 41, kv. 97, Kharkov, and Gersh Abramovich Dorfman, ulitsa Dmitrievskaya, 20, kv. 10, Kharkov, all of U.S.S.R.

Filed Mar. 5, 1976, Ser. No. 664,065

Int. Cl.[2] C10B *31/04, 37/02, 53/04*

U.S. Cl. 201—40 7 Claims



1. A method of smokeless charging of coke ovens with coal charge, said coke ovens having a plurality of chambers, each of said chambers having at least three charging holes, two of said charging holes being arranged near the extreme ends of each of said chambers and one of said charging holes being arranged in the center of each of said chambers, comprising pouring coal into a first chamber of the coke ovens through its extreme end and central holes from the outlets of a coal-charging machine in two stages, the first of said two stages including positioning a coal-charging machine having at least three outlets, two of said outlets being arranged near the extreme ends of said coal-charging machine and one of said outlets being arranged in the center of said coal-charging machine and displaced from the extreme outlets in the direction of movement of said coal-charging machine, over a first chamber such that the extreme outlets of said coal-charging machine are positioned over the extreme end holes of said first chamber, pouring a coal charge into said first chamber through said extreme end holes, withdrawing charging gases simultaneously through a gas discharge means, advancing said coal-charging machine into a position wherein the extreme outlets of said coal-charging machine are over the extreme end holes of a nearby second chamber which is next in terms of a charging schedule and the central outlet is over the central hole of said first chamber, and simultaneously holding the coal charge in said first chamber over a time period sufficient for said coal-charging machine to advance to said second chamber, the second of said two stages including pouring a coal charge into said first chamber through said central hole, withdrawing charging gases simultaneously through said gas discharge means, and pouring a coal charge through the extreme end holes of said second chamber in terms of said charging schedule simultaneously with the filling of said first chamber through said central hole.

4,071,415

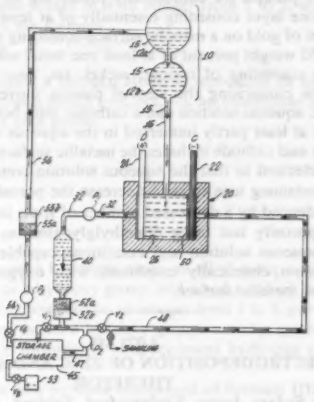
METHOD OF ELECTROPLATING ALUMINUM AND ITS ALLOYS

Jack Yea Wong, 4791 Calle de Lucia, San Jose, Calif. 95124

Continuation-in-part of Ser. No. 645,552, Dec. 31, 1975, Pat. No. 4,003,804. This application Oct. 21, 1976, Ser. No. 734,679

Int. Cl.[2] C25D *3/44, 21/16, 21/18*

U.S. Cl. 204—14 N 23 Claims



1. In a continuous plating process, the steps of:

a. forming a fresh electroplating solution containing an aluminum cationic plating species;

b. transferring said fresh electroplating solution to a plating cell;

c. depositing aluminum onto a cathodic substrate within said plating cell at low voltages on the order of less than five volts to produce an electroplating solution which is aluminum-cation poor;

d. transferring said aluminum-cation poor electroplating solution to a regeneration zone including activated aluminum for reaction of said aluminum-cation poor electroplating solution with said activated aluminum to produce an enriched electroplating solution, having an aluminum cationic plating species with an aluminum ion molarity greater than that of said aluminum-cation poor electroplating solution; and

e. returning said thusly enriched electroplating solution, to said plating cell for further plating of aluminum therefrom.

4,071,416

TREATMENT OF CHROMIUM-CONTAINING IRON ALLOYS

William H. Sutton, Birmingham, England, assignor to The International Nickel Company, Inc., New York, N.Y.

Filed Feb. 4, 1977, Ser. No. 765,442

Claims priority, application United Kingdom, Feb. 13, 1976, 5779/76

Int. Cl.[2] C25D *11/00, 5/00*

U.S. Cl. 204—38 R 6 Claims

1. A method of providing a hard film on the surface of a stainless steel comprising treating the stainless steel in an aqueous solution of chromic and sulphuric acids, with or without other constituents to provide a film on the surface thereof, without heat treating the film subjecting the stainless steel bearing the film to electrolysis as the cathode in a hardening electrolyte and thereafter treating the stainless steel bearing the hardened film in an aqueous solution of a water soluble silicate for a period of time of at least about 5 minutes sufficient to harden the film.

4,071,417
PROCESS FOR DECREASING THE POROSITY OF GOLD

Donald Eldridge Koontz, Summit, and Peter Kenny Skurkiss, Short Hills, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 29, 1977, Ser. No. 811,039
Int. Cl.[2] C25D *5/48, 11/38*
U.S. Cl. 204—38 B 15 Claims

1. A process for cathodically producing an article with at least one layer consisting essentially of at least 90 percent by weight of gold on a metallic surface consisting essentially of at least 50 weight percent of at least one metal selected from the group consisting of copper, nickel, tin, zinc and iron, said process comprising the step of passing current through an anode, aqueous solution and a cathode, with both cathode and anode at least partly immersed in the aqueous solution and in which said cathode includes the metallic surface with the layer characterized in that the aqueous solution comprises chromium-containing ions so as to decrease the porosity of the layer as evidenced by a decreased number of spots in an electrographic porosity test using dimethylglyoxime as the indicator, said aqueous solution and conditions capable of depositing chromium chemically combined with oxygen on the unlayered metallic surface.

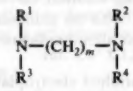
4,071,418
ELECTRODEPOSITION OF ZINC AND ADDITIVES THEREFOR

Barrie Sydney James, Kingswinford, England, assignor to W. Canning & Company, Ltd., Birmingham, England

Filed Apr. 9, 1976, Ser. No. 675,480
Claims priority, application United Kingdom, Apr. 15, 1975, 15482/75
The portion of the term of this patent subsequent to Jan. 31, 1995, has been disclaimed.
Int. Cl.[2] C25D *3/22*
U.S. Cl. 204—55 R 17 Claims

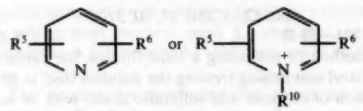
1. In an aqueous alkaline, cyanide-free zinc electroplating bath containing zinc ions and hydroxyl ions, the improvement comprising said bath including an effective brightening amount of

a. at least one linear polyamine obtained by condensing a diamine of the formula


(I)

where R^1 and R^3, which may be the same or different, each represent an alkyl group with 1 to 4 carbon atoms, and R^2 and R^4, which may be the same or different, each represent a hydrogen atom or an alkyl group with 1 to 4 carbon atoms, and where *m* is an integer from 1 to 5, with a 1,3-dihalopropan-2-ol; together with

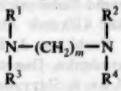
b. at least one pyridine compound in the form of free base or as quaternised derivatives, in which the pyridine compound is a pyridine compound of Formula (IIa) or a pyridine compound having a cation of formula (IIb):


(IIa) (IIb)

where R^5 represents a hydrogen atom or an alkyl group with 1 to 5 carbon atoms; and R^6 represents a cyano group, a group —$COOR^7$ where R^7 represents a hydrogen atom, an alkali metal cation or an alkyl group with 1 to 5 carbon atoms; and R^{10} represents a radical selected from the group consisting of aralkyl, alkyl, alkenyl, esterified carboxyalkyl and hydroxyalkyl groups.

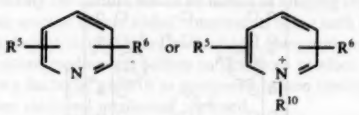
10. A brightener composition for addition to an alkaline, cyanide-free zinc electroplating bath, comprising a mixed solution of

a. at least one linear polyamine obtained by condensing a diamine of the formula:


(I)

where R^1 and R^3, which may be the same or different, each represent an alkyl group with 1 to 4 carbon atoms, and R^2 and R^4, which may be the same or different, each represent a hydrogen atom or an alkyl group with 1 to 4 carbon atoms, and where *m* is an integer from 1 to 5, with a 1,3-dihalopropan-2-ol; and

b. at least one pyridine compound in the form of a free base or as a quaternised derivative, in which the pyridine compound is a pyridine compound of formula (IIa) or a pyridine compound having a cation of formula (IIb):


(IIa) (IIb)

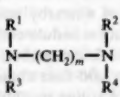
where R^5 represents a hydrogen atom or an alkyl group with 1 to 5 carbon atoms; and R^6 represents a cyano group, a group —$COOR^7$ where R^7 represents a hydrogen atom, an alkali metal cation or an alkyl group with 1 to 5 carbon atoms; or a group —$CONR^8R^9$ where R^8 and R^9 which may be the same or different each represents a hydrogen atom or an alkyl group with 1 to 5 carbon atoms; and R^{10} represents an aralkyl, alkyl, alkenyl, esterified carboxyalkyl or hydroxyalkyl group.

4,071,419
ELECTRODEPOSITION OF ZINC AND ADDITIVE THEREFORE

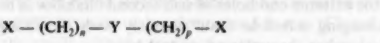
Barrie Sydney James, Kingswinford, England, assignor to W. Canning & Company, Ltd., Birmingham, England

Filed Apr. 9, 1976, Ser. No. 675,500
Claims priority, application United Kingdom, Apr. 15, 1975, 15482/75
The portion of the term of this patent subsequent to Jan. 31, 1995, has been disclaimed.
Int. Cl.[2] C25D *3/22*
U.S. Cl. 204—55 R 24 Claims

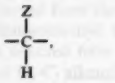
1. In an aqueous alkaline, cyanide-free zinc electroplating bath containing zinc ions and hydroxyl ions, the improvement comprising: including in said bath an effective brightening amount of at least one linear polyamine obtained by condensing a diamine of the formula:


(I)

where R^1, R^2, R^3 and R^4, which may be the same or different, each represent a hydrogen atom or an alkyl group with 1 to 4 carbon atoms, and where *m* is an integer from 1 to 5, with a dihalide of the formula


(II)

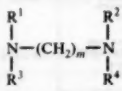
where X represents a halogen atom, Y represents an oxygen atom, an ethynylene group (—C≡C—), an ethenylene group (—HC=CH—), or a group



where Z represents a hydrogen atom or an alkyl group with 1 to 4 carbon atoms and *n* and *p*, which may be the same or different, are zero or an integer from 1 to 5.

8. In an aqueous alkaline, cyanide-free zinc electroplating bath containing zinc ions and hydroxyl ions, the improvement comprising: including in said bath an effective brightening amount of

a. at least one linear polyamine obtained by condensing a diamine of the formula:

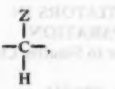


(I)

where R^1, R^2, R^3 and R^4, which may be the same or different, each represent a hydrogen atom or an alkyl group with 1 to 4 carbon atoms, and where *m* is an integer from 1 to 5, with a dihalide of the formula

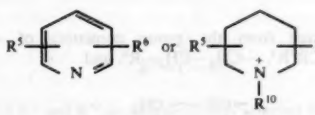
$$X-(CH_2)_n-Y-(CH_2)_p-X \quad (II)$$

where X represents a halogen atom, Y represents an oxygen atom, an ethynylene group (—C≡C—), an ethenylene group (—HC=CH—), or a group



where Z represents a hydrogen atom, an alkyl group with 1 to 4 carbon atoms or a hydroxy group, and *n* and *p*, which may be the same of different, are zero or an integer from 1 to 5; provided that when Z represents a hydroxy group and *n* and *p* are both 1, R^1 and R^2 in formula (I) both represent hydrogen atoms; together with

b. at least one of a pyridine compound of formula IIIa or a pyridine compound having a cation of formula III (*b*)

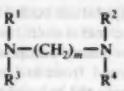


(IIIa) (IIIb)

where R^5 represents a hydrogen atom or an alkyl group with 1 to 5 carbon atoms; and R^6 represents a cyano group, a group -$COOR^7$ where R^7 represents a hydrogen atom, an alkali metal cation or an alkyl group with 1 to 5 carbon atoms; or a group —$CONR^8R^9$ where R^8 and R^9 which may be the same or different each represents a hydrogen atom or an alkyl group with 1 to 5 carbon atoms; and R^{10} represents a radical selected from the group consisting of aralkyl, alkyl, alkenyl, esterified carboxyalkyl and hydroxyalkyl groups.

15. A brightener composition for addition to an alkaline, cyanide-free zinc electroplating bath, comprising a mixed solution of

a. at least one linear polyamine obtained by condensing a diamine of the formula:



(I)

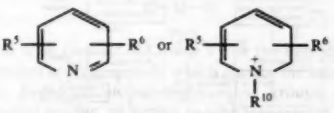
where R^1, R^2, R^3 and R^4, which may be the same or different, each represents a hydrogen atom or an alkyl group with 1 to 4 carbon atoms, and where *m* is an integer from 1 to 5, with an alkyl dihalide of the formula

$$X-(CH_2)_n-Y-(CH_2)_p-X \quad (II)$$

where X represents a halogen atom; Y represents an oxygen atom, an ethynylene group (—C≡C—), an ethenylene group (—HC=CH—), or a group

where Z represents a hydrogen atom, an alkyl group with 1 to 4 carbon atoms or a hydroxy group, and *n* and *p*, which may be the same different, are zero or an integer from 1 to 5; provided that when Z represents a hydroxy group, *n* and *p* are both 1 and R^1 and R^2 in formula (I) both represent hydrogen atoms; and

b. at least one of a pyridine compound of formula IIIa or a pyridine compound having a cation of formula IIIb



(IIIa) (IIIb)

where R^5 represents a hydrogen atom or an alkyl group with 1 to 5 carbon atoms; and R^6 represents a cyano group, a group -$COOR^7$ where R^7 represents a hydrogen atom, an alkali metal cation or an alkyl group with 1 to 5 carbon atoms; or a group $CONR^8R^9$ where R^8 and R^9 which may be the same or different each represents a hydrogen atom or an alkyl group with 1 to 5 carbon atoms and R^{10} represents an aralkyl, alkyl, alkenyl, esterified carboxyalkyl or hydroxyalkyl group.

4,071,420

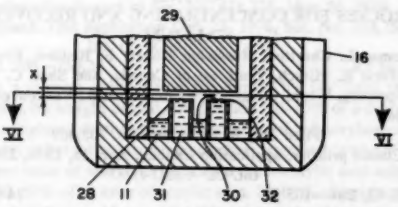
ELECTROLYTIC PRODUCTION OF METAL

Perry A. Foster, Jr., New Kensington, and Stanley C. Jacobs, Lower Burrell, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 645,534, Dec. 21, 1975, abandoned. This application Aug. 25, 1976, Ser. No. 717,699

Int. Cl.² *C25C 3/06*

U.S. Cl. 204—67 **8 Claims**



1. A method for the electrolytic production of metal, including electrolyzing, between anodic and cathodic surface areas, a

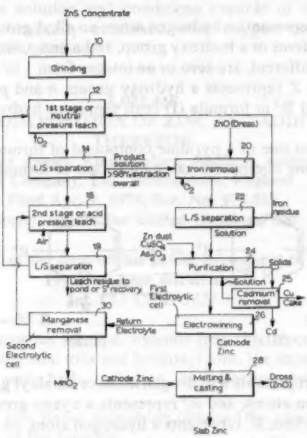
compound of the metal dissolved in a molten solvent, the electrolyzing being performed at a temperature such that the metal is formed in the molten state, the metal collecting in a molten metal pad, wherein the improvement comprises the provision of cathodic surface area formed from at least one hollow body protruding out of the pad into the solvent toward the anodic surface area, the hollow body containing molten material and being open at its end closest the anodic surface area and sealed at its end in the pad.

4,071,421

PROCESS FOR THE RECOVERY OF ZINC

Ian M. Masters; Gerald L. Bolton, both of Fort Saskatchewan, and Verner B. Sefton, Edmonton, all of Canada, assignors to Sherritt Gordon Mines Limited, Toronto, Canada

Filed Sept. 17, 1976, Ser. No. 724,423
Claims priority, application Canada, Aug. 11, 1976, 258881
Int. Cl.[2] C25B *1/00*; C25C *1/16*
U.S. Cl. 204—96 **15 Claims**



1. A process for recovering zinc and manganese dioxide from material containing zinc and manganese compounds, including treating the material to provide an aqueous sulphate solution containing manganese and zinc ions, electrolyzing the solution in one electrolytic cell with conditions inhibiting the formation of manganese dioxide and favouring the deposition of zinc, said one electrolytic cell containing from about 5 to about 45 g.p.l. manganese ions, electrolyzing the solution in another electrolytic cell with conditions favouring the formation of manganese dioxide, said other electrolytic cell containing from about 30 to about 100 g.p.l. zinc ions, recovering zinc from said one electrolytic cell, and recovering manganese dioxide from said other electrolytic cell.

4,071,422

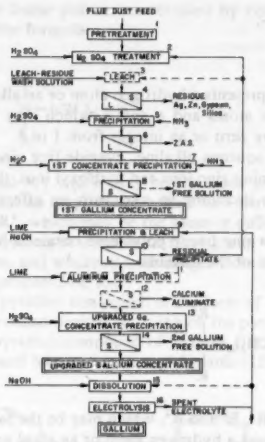
PROCESS FOR CONCENTRATING AND RECOVERING GALLIUM

Thomas L. Charlton, Rossland; Robert F. Redden, Fruitvale; Horst E. Hirsch, Trail, all of Canada, and Shou C. Liang, Spokane, Wash., assignors to Cominco Ltd., Vancouver, Canada

Filed July 8, 1976, Ser. No. 703,409
Claims priority, application Canada, Apr. 15, 1976, 250752
Int. Cl.[2] C25C *1/00*
U.S. Cl. 204—105 R **24 Claims**

1. A process for treating phosphorus-furnace flue dust containing gallium and zinc which comprises the steps of:

1. treating flue dust with sulfuric acid for formation of a leach solution and a leach residue;
2. separating the leach solution from the leach residue;
3. precipitating zinc in the leach solution in the presence of ammonium sulfate as zinc ammonium sulfate hexahydrate;
4. separating precipitated zinc from the solution;



5. adding an alkaline material to said solution for precipitation of a first gallium concentrate and formation of a first gallium-free solution; and
6. separating first gallium concentrate from said first gallium-free solution for recovery of said first gallium concentrate.

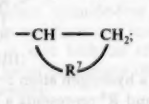
4,071,423

USE OF FREE RADICAL INITIATORS IN THIOLCARBAMATE PREPARATION

Harold M. Pitt, Lafayette, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

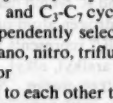
Filed Apr. 29, 1977, Ser. No. 792,364
Int. Cl.[2] B01J *1/10*; C07C *155/02, 155/03*
U.S. Cl. 204—158 R **12 Claims**

1. A process for the manufacture of a thiolcarbamate having the formula



in which

R^1 is selected from the group consisting of $—CH_2—CH=CR^4R^5$, $—CH_2—CH_2—R^6$, and



R^2 and R^3 are independently selected from the group consisting of the following substituted or unsubstituted groups: C_1-C_{10} alkyl, C_2-C_6 alkenyl, C_2-C_4 alkynyl, aralkyl containing a C_1-C_6 alkyl, and C_3-C_7 cycloalkyl; wherein the substituents are independently selected from the group consisting of halo, cyano, nitro, trifluoromethyl, C_1-C_4 alkoxy, and C_1-C_4 alkyl; or

R^2 and R^3 are joined to each other to form, together with the nitrogen atom, a nitrogen-containing heterocyclic ring;

R^4, R^5, and R^6 are independently selected from the group consisting of hydrogen and the following substituted or unsubstituted groups: C_1-C_{10} alkyl, C_2-C_6 alkenyl, C_2-C_4 alkynyl, aryl, aralkyl containing a C_1-C_6 alkyl, C_3-C_7 cy-

cloalkyl, C_5-C_7 cycloalkenyl, C_1-C_{10} alkoxy, C_2-C_6 alkenoxy, C_2-C_{10} alkoxyalkyl, C_2-C_{10} alkylthioalkyl, C_3-C_{10} alkoxyalkenyl, C_3-C_{10} alkylthioalkenyl, and heterocyclic ring groups; wherein the substituents are independently selected from the group consisting of halo, cyano, nitro, trifluoromethyl, C_1-C_4 alkoxy, and C_1-C_4 alkyl; and

R^7 is selected from the group consisting of C_1-C_5 alkylene and C_3-C_5 alkenylene;

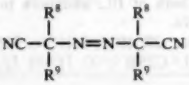
which comprises reacting a secondary amine having the formula

in which R^2 and R^3 are as defined above, with carbonyl sulfide and an unsaturated compound selected from the group consisting of

$CH_2{=}C{=}CR^4R^5$, $CH_2{=}CH{-}R^6$, and

in which R^4, R^5, R^6, and R^7 are as defined above, in the presence of at least one free radical initiator selected from the group consisting of

a. an azonitrile having the formula



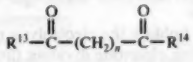
in which R^8 and R^9 are independently selected from the group consisting of C_1-C_6 alkyl, phenyl, phenylalkyl containing a C_1-C_3 alkyl, and C_3-C_6 cycloalkyl; or R^8 and R^9 conjointly form C_3-C_9 alkylene;

b. a phosphite having the formula $(R^{10})_2POH$ or $(R^{10})_3P$ in which R^{10} is selected from the group consisting of C_1-C_6 alkyl, C_1-C_6 alkoxy, phenoxy, and phenylthio;

c. a ketone in the presence of ultraviolet light, said ketone having the formula

in which R^{11} and R^{12} are independently selected from the group consisting of C_1-C_6 alkyl, phenyl, and phenylalkyl containing a C_1-C_3 alkyl;

d. a dione having the formula



in which R^{13} and R^{14} are independently selected from the group consisting of C_1-C_6 alkyl and phenyl, and n is an integer ranging from 0 to 6;

e. a substituted or unsubstituted aromatic compound selected from the group consisting of phenanthrene, naphthalene, and quinoline; wherein the substituents are halo or methyl.

4,071,424

PHOTOPOLYMERIZABLE COMPOSITION

Edward Charles Dart, and Josef Nemcek, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, Great Britain

Continuation of Ser. No. 294,781, Oct. 4, 1972, abandoned. This application Feb. 11, 1975, Ser. No. 549,052

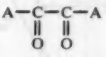
Claims priority, application United Kingdom, Oct. 18, 1971, 48365/71; Mar. 2, 1972, 9807/72

Int. Cl.[2] C08F *8/00, 8/18, 2/46*

U.S. Cl. 204—159.15 **12 Claims**

1. A photopolymerisable composition comprising at least one polymerisable ethylenically unsaturated material and a photosensitive catalyst comprising

a. at least one photosensitizer having the structure



wherein the groups A, which may be the same or different, are hydrocarbyl or substituted hydrocarbyl groups, and wherein the groups A may be further linked together by a direct link or by a divalent hydrocarbyl group or wherein the groups A together form a fused aromatic ring, and

b. at least one reducing agent capable of reducing the photosensitiser when the photosensitiser is in an excited state, the reducing agent having the structure

where M is an element of Group Vb of the Periodic Table of the Elements and the units R, which may be the same or different, are hydrogen atoms, hydrocarbyl groups, substituted hydrocarbyl groups, or groups in which two units R together with the element M form a cyclic ring system, no more than one of said groups R being substituted hydrocarbyl groups, no more than two of the units R being hydrogen atoms and the element M not being attached directly to an aromatic group R.

4,071,425

RADIATION CURABLE COATING

John P. Guarino, Trenton, and William H. McCarty, White House Station, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 471,375, May 20, 1974, abandoned. This application Dec. 23, 1976, Ser. No. 753,755

Int. Cl.[2] C08F *2/46, 4/00*

U.S. Cl. 204—159.24 **6 Claims**

1. In a coating composition for curing by UV light that comprises, by weight of said composition, 10–30% of a diacrylate of a diglycidyl ether of a bisphenol or of a diacrylate of a diglycidyl ether of a bisphenol further esterified with 0.1–1 mole, per mole of said diacrylate, of a dicarboxylic acid anhydride, 30–60% of an ester of acrylic acid, 25–60% of a pigment, and a sensitizer combination 0.1–6% of 2-chlorothioxanthone and 0.5–6% of a tertiary amine; the improvement of increasing the gloss of a UV cured film thereof consisting essentially of using in said coating composition 0.1–6% of a phenone.

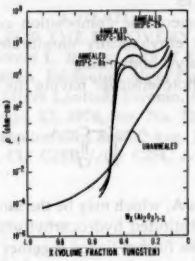
4,071,426
METHOD OF MAKING HIGH RESISTANCE CERMET FILM

Harry Louis Pinch; Benjamin Abeles, both of Princeton, and Jonathan Isaac Gittleman, Trenton, all of N.J., assignors to RCA Corporation, New York, N.Y.

Division of Ser. No. 543,629, Jan. 23, 1975, Pat. No. 4,010,312. This application Nov. 26, 1976, Ser. No. 745,411

Int. Cl.[2] C23C *15/00*

U.S. Cl. 204—192 F **18 Claims**



12. A method of making a high resistance cermet film, comprising the steps of:

a. sputtering a granular film of a metal and an insulator onto a substrate at a pressure low enough so as to substantially prevent impurities from developing in said film, said granular film having a metal percent volume no greater than the metal percent volume at which the percolation threshold appears; and then

b. annealing the deposited film in a reducing atmosphere so as to result in a controlled upward adjustment of the resistivity of said film, said upward adjustment being substantially independent of the composition of said film,

14. A method in accordance with claim **12** in which said metal is selected from the group consisting of molybdenum, tungsten, cobalt and nickel.

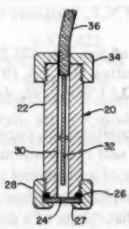
4,071,427
ARSENITE ELECTRODE

Kuang Lu Cheng, Kansas City, Mo., and Eric En-Kuang Chao, Waterloo, Canada, assignors to Curators of the University of Missouri, Columbia, Mo.

Filed Nov. 17, 1976, Ser. No. 742,597

Int. Cl.[2] G01N *27/46*

U.S. Cl. 204—195 M **8 Claims**



1. In an electrode for potentiometric determination of the activity of ions in solution, an element sensitive to arsenite ions comprising a membrane of a mixture of Ag_2S and Ag_3AsO_3.

4,071,428
PROCESS FOR ELECTRODEPOSITION OF QUATERNARY AMMONIUM SALT GROUP-CONTAINING RESINS

Joseph F. Bosso, Lower Burrell, and Marco Wismer, Gibsonia, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 24, 1976, Ser. No. 744,534

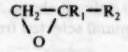
Int. Cl.[2] C25D *13/06*

U.S. Cl. 204—181 C **10 Claims**

1. A method of electrocoating an electrically conductive surface serving as a cathode in an electrical circuit comprising said cathode, an anode and an aqueous dispersion of an electrodepositable composition, wherein the electrodepositable composition comprises the reaction product of:

1. a polymeric tertiary amine,

2. a 1,2-epoxy-containing material having the structural formula:



where R_1 is selected from the class consisting of hydrogen and methyl and R_2 is selected from the class consisting of hydrogen, alkyl including cycloalkyl, aryl and substituted alkyl and aryl; said reaction being conducted in the presence of acid and/or water to form the quaternary ammonium base group-containing polymer through reaction of the epoxy moieties with the tertiary amine moieties.

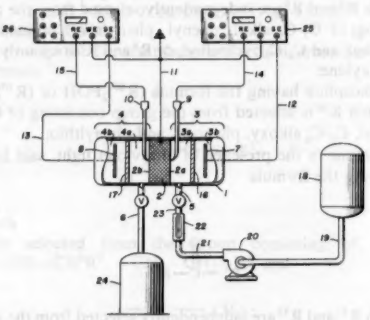
4,071,429
ELECTROLYTIC FLOW-CELL APPARATUS AND PROCESS FOR EFFECTING SEQUENTIAL ELECTROCHEMICAL REACTION

John H. Wagenknecht, Kirkwood, Mo., and Dean G. Laurin, Mount Prospect, both of Ill., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 29, 1976, Ser. No. 755,312

Int. Cl.[2] C25B *9/00, 11/00, 13/00*

U.S. Cl. 204—231 **16 Claims**



1. An electrolytic flow-cell apparatus suitable for effecting sequential electrochemical reactions of redoxidative compounds in a liquid electrolysis medium comprising such redoxidative compound, solvent, and supporting electrolyte, which apparatus comprises:

a. a container for holding the electrolysis medium;

b. a porous working electrode dividing the container into a first compartment and a second compartment, the electrode having a first face in the first compartment and a second and opposite face in the second compartment, at which faces the sequential reactions are conducted;

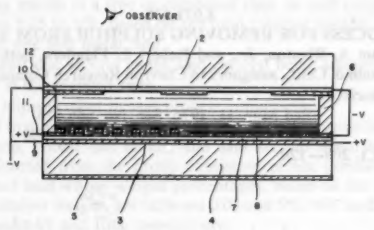
c. at least one first secondary electrode located in the first compartment and spaced from the first face of the working electrode;

d. at least one second secondary electrode located in the second compartment and spaced from the second face of the working electrode;
e. a first means for establishing a selectible electrical potential at the first face of the working electrode;
f. a second means for establishing a selectible electrical potential at the second and opposite face of the working electrode;
g. inlet means for admitting the electrolysis medium to the first compartment;
h. means for effecting flow of the electrolysis medium into the first compartment, through the working electrode, and thence into the second compartment; and
i. outlet means for withdrawing the sequentially electrolyzed electrolysis medium from the second compartment.

4,071,430
ELECTROPHORETIC IMAGE DISPLAY HAVING AN IMPROVED SWITCHING TIME

Richard B. Liebert, Ridgefield, Conn., assignor to North American Philips Corporation, New York, N.Y.

Filed Dec. 6, 1976, Ser. No. 747,559
Int. Cl.[2] G03G *15/00;* C25D *13/00*
U.S. Cl. 204—299 R **6 Claims**

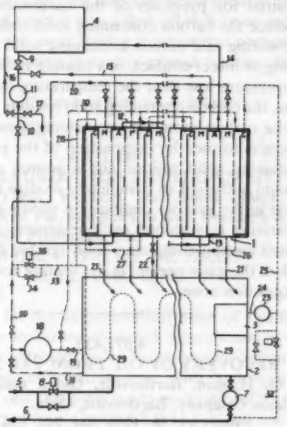


1. An electrophoretic visual display device comprising:
an electrophoretic suspension comprising a dispersion of pigment particles in a dielectric suspending liquid, a dye adapted to provide the suspending liquid with a color contrasting to that of the pigment particles and a charging material for introducing a charge on the pigment particles;
a first transparent electrode;
at least one segmented electrode having a major surface in opposition to the major surface of said first transparent electrode and spaced therefrom by at least one thin insulating member, said electrodes and said thin insulation members forming a cell for containing said electrophoretic suspension;
a transparent insulating layer positioned on the major surface of said segmented electrode opposed to said first transparent electrode;
a mesh electrode in the shape of the segment electrode having holes barely visible to the naked eye positioned on said transparent insulating layer between said segmented electrode and said transparent insulating layer; one of said mesh electrode and said segmented electrode being formed of light reflective metal and voltage supply means for supplying a reversible electric field between said mesh electrode and said segmented electrode.

4,071,431
INSTALLATION FOR THE TREATMENT OF METALS PICKLING SOLUTIONS

Oliver Nicou, Chatillon-sur-Bagneux, and Roger Lumbroso, Paris, both of France, assignors to Socomaten, Clamart, France

Filed June 18, 1976, Ser. No. 697,464
Claims priority, application France, June 18, 1975, 75 19081
Int. Cl.[2] B01D *13/02;* C25C *1/06*
U.S. Cl. 204—301 **10 Claims**



1. An installation for treatment of solutions used for pickling metals which comprises:
a treatment tank,
a plurality of sealed cases comprising anode compartments suspended in said tank, each of said anode compartments comprising a pair of longitudinal side walls extending into said tank and containing an electrical anode, at least one ion exchange membrane mounted on each of said side walls, each of said anode compartments being removable from said tank,
a plurality of sealed cases comprising cathode compartments suspended in said tank and spaced apart from said anode compartments, each of said cathode compartments comprising a pair of longitudinal side walls extending into said tank and containing an electrical cathode, at least one ion exchange membrane mounted on each of said side walls, said cathode compartments being removable from said tank, and
a plurality of central compartments within said tank, each of said central compartments being defined by one side wall of an anode compartment and one side wall of a cathode compartment.

4,071,432
STAGED HEATING BY OXIDATION OF CARBONACEOUS MATERIAL

Everett W. Knell, Los Alamitos, and Norman W. Green, Upland, both of Calif., assignors to Occidental Petroleum Corporation, Los Angeles, Calif.

Filed June 25, 1976, Ser. No. 700,042
Int. Cl.[2] C10G *1/02*
U.S. Cl. 208—8 **26 Claims**

1. In a continuous process for pyrolyzing a carbonaceous material in which heat for pyrolysis is obtained by partially oxidizing a carbon containing solid residue of said pyrolysis in the presence of oxygen in a combustion zone to form a particulate source of heat which is combined with the carbonaceous material in a pyrolysis reaction zone to initiate pyrolysis of the carbonaceous material, the improvement comprising the steps of:

a. at least partially oxidizing in the combustion zone a portion of a preheated carbon containing solid residue in the presence of oxygen to yield the particulate source of heat and gaseous combustion products including carbon monoxide;
b. separating the particulate source of heat from the gaseous combustion products of the preheated carbon containing solid residue in a first cyclone separation zone;
c. passing the particulate source of heat to the pyrolysis reaction zone to provide at least a portion of the heat required for pyrolysis of the carbonaceous material to produce the carbon containing solid residue;
d. preheating said carbon containing solid residue by combining in direct contact, in a heating zone maintained at a temperature less than the temperature in the combustion zone, the carbon containing solid residue, at least a portion of the carbon monoxide containing gaseous combustion products formed by combustion of the preheated carbon containing solid residue and a source of oxygen in an amount sufficient to completely oxidize the carbon monoxide in the gaseous combustion products; and
e. separating in a second cyclone separation zone the preheated carbon containing solid residue from at least the bulk of the gases present in the heating zone for feed to the combustion zone.

4,071,433

RECOVERY OF OIL FROM TAR SANDS

Donald O. Hanson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 28, 1976, Ser. No. 736,283
Int. Cl.[2] C10G *1/04;* C10B *57/04;* C10G *9/00*
U.S. Cl. 208—11 LE **7 Claims**

1. A process for recovering oil from tar sands which comprises:
a. blending in a mixing zone tar sand with a sufficient amount of solvent oil to make a flowable slurry;
b. subdividing said flowable slurry in a subdividing zone into an underflow stream containing coarse sand particles and an overflow stream containing fine sand particles;
c. passing the underflow stream through a solids removal zone to remove coarse sand particles contained therein;
d. introducing the overflow stream into a coking zone and therein subjecting it to such conditions as to produce coke and vapors;
e. feeding the vapors produced in step (d) and the underflow stream after it passes the solid removal zone into the bottom section and the midsection of a fractionation zone respectively;
f. maintaining such temperature and pressure in said fractionation zone as to separate the feed introduced therein into cuts including an overhead comprising mainly gas, gasoline and water, a first intermediate cut comprising mainly kerosine, a second intermediate cut comprising mainly light gas oil, a third intermediate cut comprising mainly heavy gas oil and heavy bottoms comprising mainly high boiling fractions; and,
g. withdrawing each of the cuts as a separate stream from said fractionation zone.

4,071,434

RECOVERY OF OIL FROM TAR SANDS

Phillip H. Gifford, II, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 30, 1976, Ser. No. 718,646
Int. Cl.[2] C10G *1/04;* C10B *57/04;* C10G *9/00*
U.S. Cl. 208—11 LE **5 Claims**

1. A process for recovery of oil and other valuable components from tar sand which comprises:
a. introducing into a mixing zone tar sand and a sufficient amount of a solvent to form a flowable slurry;
b. mixing tar sand and solvent in the mixing zone until a slurry of desired viscosity is produced;
c. subdividing the slurry produced in step (b) into two streams, a first stream containing coarse solids and a second stream containing fine solids;
d. passing the said first stream through a solids removal zone to remove the coarse solids therein; and
e. introducing the first stream, after it has passed through the solids removal zone, and the second stream, still containing the fine solids, into a coking zone to produce vapors and coke.

4,071,435

DENITROGENATION OF SYNCRUDE

Robert H. Smith, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed June 6, 1977, Ser. No. 803,832
Int. Cl.[2] C10G *25/00, 13/02*
U.S. Cl. 208—91 **6 Claims**

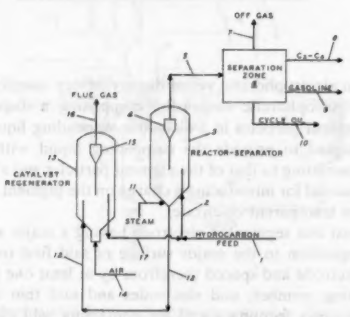
1. A method for reducing the nitrogen content of a syncrude feed obtained from at least one of oil shale, tar sands, and coal, comprising
a. mixing an extractant-catalyst with said feed, said extractant-catalyst being effective for extracting, nitrogen materials from said syncrude feed and also for serving as a hydrocracking catalyst for said syncrude feed,
b. settling the mixture from step (a) into a first phase composed essentially of a first low nitrogen syncrude product, and a second phase composed essentially of said extractant-catalyst and high nitrogen-containing syncrude liquid,
c. separating said first and second phases from one another, and
d. hydrocracking said second phase to produce a second low nitrogen syncrude product.

4,071,436

PROCESS FOR REMOVING SULPHUR FROM A GAS

William A. Blanton, Jr., and Robert L. Flanders, both of San Anselmo, Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Mar. 11, 1976, Ser. No. 666,115
Int. Cl.[2] C10G *11/02;* C01B *17/16, 17/00*
U.S. Cl. 208—120 **1 Claim**



1. In a fluid catalyst cracking process including the steps of (a) cracking a sulfur-containing hydrocarbon stream in contact with a fluidized bed of a particulate cracking catalyst in a cracking zone at cracking conditions including a temperature in the range from 800° F to 1300° F, whereby sulfur-containing coke is deposited on said catalyst, and removing the hydrocarbon stream from said cracking zone; (b) passing coke-containing catalyst from said cracking zone and an oxygen-containing gas into a cracking catalyst regeneration zone, burning off said sulfur-containing coke therein at a temperature in the range from 1000° F to 1500° F to form a flue gas containing sulfur

oxides, and removing said flue gas from said catalyst regeneration zone; and (c) returning the resulting coke-depleted catalyst from said catalyst regeneration zone to contact with said hydrocarbon stream in said cracking zone; the method for decreasing the amount of sulfur oxides in said flue gas which comprises the steps of:

1. reacting sulfur oxides in said flue gas with reactive alumina contained in a particulate solid other than said catalyst, the particulate solid being physically admixed with said particulate catalyst, in said regeneration zone to form at least one solid compound including sulfur atoms and aluminum atoms in said particulate solid, and removing said flue gas from said regeneration zone; and
2. forming hydrogen sulfide from said solid compound and said hydrocarbon stream by contacting said particulate solid with said hydrocarbon stream in said cracking zone in physical admixture with said particulate cracking catalyst, and removing hydrogen sulfide from said cracking zone in said hydrocarbon stream.

4,071,437

CATALYSTS FOR THE HYDROTREATMENT OF HYDROCARBONS AND A PROCESS FOR THE PREPARATION AND UTILIZATION THEREOF

Philippe Engelhard; Joseph Edouard Weisang, and Guy Paris, all of Le Havre, France, assignors to Compagnie Francaise de Raffinage, Paris, France

Filed Apr. 8, 1975, Ser. No. 566,095
Claims priority, application France, Apr. 8, 1974, 74 12329
Int. Cl.[2] C10G *35/06;* **B01J** *21/04, 23/74*
U.S. Cl. 208—137 **47 Claims**

1. In a process for the preparation of a hydroreforming non-platinum-metal-group containing catalyst, which comprises a non-cracking refractory-mineral carrier having the following metals in a free or combined state on said carrier:

a. from 0.05 to 5%, based on the total catalyst weight, of at least one first metal, and

b. at least one second metal, said catalyst being adapted for use in the reduced state,

the improvement in said process comprising:

said first metal being selected from the group consisting of iron, cobalt and nickel; and said second metal being selected from the group consisting of tin, germanium and lead whose weight percentages, based on the total catalyst weight, are between 0.02 and 5%, 0.01 and 4%, and 0.01 and 10% respectively;

said refractory carrier being impregnated by at least one impregnation solution containing cations and/or anions formed from at least one of said first metals and by the same or at least a second solution containing cations and/or anions formed from at least one of said second metals;

each second metal being deposited on said carrier, dried if necessary, and calcined between 400 and 700° C, and

said catalyst being dried after deposit of the first metals and any calcination of any of the first metals not exceeding 500° C.

4,071,438

METHOD OF RECLAIMING WASTE OIL BY DISTILLATION AND EXTRACTION

Richard H. O'Blasny, Overland Park, Kans., assignor to Vacsol Corporation, Kansas City, Kans.

Filed June 3, 1976, Ser. No. 692,443
Int. Cl.[2] C10M *11/00*
U.S. Cl. 208—180 **8 Claims**

1. A method of reclaiming additive-supplemented waste oil, comprising the steps of:

providing a quantity of additive-supplemented waste oil having impurities therein;

heat treating said waste oil to remove at least a portion of any water therein, and further treating the oil by fractional distillation to remove at least a portion of the light ends therefrom;

removing a substantial portion of the impurities in the fractionally distilled waste oil by sequentially vacuum distilling the same to give at least one overhead fraction, and a bottoms fraction, said overhead fraction having a boiling point lower than that of said bottoms fractions, and thereafter contacting said overhead fraction with a quantity of nitrobenzene, the ratio of nitrobenzene to oil being from about 0.5:1 to 1.5:1, for effecting separation of the contacted oil and solvent into a first oil-rich layer and a second solvent-rich layer having a substantial portion of the impurities remaining in said overhead fraction dispersed therein; and

recovering the oil from said first oil-rich layer.

4,071,439

HYDRODESULFURIZATION SHUTDOWN METHOD

Stephen Joseph Yanik, Valencia, and James Albert Frayer, Pittsburgh, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Oct. 4, 1976, Ser. No. 729,185
Int. Cl.[2] C10G *23/02*
U.S. Cl. 208—216 **6 Claims**

1. In a process for the hydrodesulfurization of a sulfur-containing residual hydrocarbon feedstock wherein said hydrocarbon feedstock is contacted under hydrodesulfurization conditions in a hydrodesulfurization zone with hydrogen and a catalyst, wherein said catalyst consists essentially of a hydrogenating metal selected from Group VI-B and at least one hydrogenating metal selected from Group VIII, said hydrogenating metals being in the sulfided form and being supported on a refractory oxide carrier selected from the group consisting of alumina, a silica-stabilized alumina containing up to about 5 percent by weight based upon the carrier of silica, silica gels, acid leached boro-silicate glass, and spinels and wherein said catalyst is being promoted with from about 1.0 to about 10.0 weight percent of a Group IV-B metal; a shutdown procedure for said process which comprises lowering the reaction temperature in said hydrodesulfurization zone while maintaining the flow of residual hydrocarbon feedstock and hydrogen to sajd hydrodesulfurization zone, substituting a distillate feed for the residual hydrocarbon feedstock to said hydrodesulfurization zone after said temperature has been lowered, eliminating the flow of hydrogen to said hydrodesulfurization zone after said substituting step, and continuing to cool said catalyst in the absence of hydrogen by passing said distillate hydrocarbon through said hydrodesulfurization zone.

4,071,440

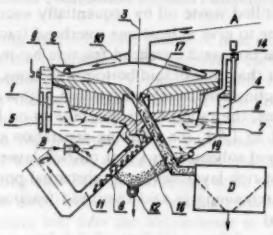
METHOD AND APPARATUS OF STRATIFICATION WITH TANGENTIAL FEED

Antoni Jędo, Gliwice; Wacław Jachna, Tychy, and Adolf Szczęsny, Zabrue, all of Poland, assignors to Centralny Osrodek Projektowokonstrukcyjny Maszyn Gorniczych "Komag", Gliwice, Poland

Filed July 22, 1976, Ser. No. 707,663
Claims priority, application Poland, July 28, 1975, 182377
Int. Cl.[2] B03B *5/20*
U.S. Cl. 209—44 **11 Claims**

1. A method for separation of a mixture of mineral grains having different specific gravities comprising introducing a raw mixture of mineral grains with water tangentially at the outer wall of a trough with an initial velocity to produce circulation of the stream of the mixture at least near an upper edge of said outer wall along a path around a central axis causing the mineral grains to selectively flow along spiral trajectories within the trough from the outer wall towards the central axis in accordance with the specific gravities of the grains, supplying pulsating water into said trough in alternate upward and downward direction to facilitate separation

therein of the grains into light and heavy fractions along said spiral trajectories and discharging the separated light and



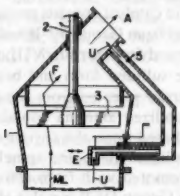
heavy fractions separately into the region of the central axis in the trough.

4,071,441

BYPASS SEPARATOR

Siegfried Schauer, Kaiserslautern-Hohenecken, Germany, assignor to Gebr. Pfeiffer AG, Kaiserlougen, Germany

Filed Nov. 28, 1975, Ser. No. 636,210
Claims priority, application Germany, Dec. 3, 1974, 2456970
Int. Cl.[2] B07B *7/083*
U.S. Cl. 209—144 **6 Claims**



1. A separator for separating the larger particles from a powder-air stream such as obtain from a grinding mill and for recovering a power-air stream with a reduced but adjustable powder size distribution, said separator being of the type comprising a housing, means to create a swirl of air moving in one direction to provide a separation zone having an upstream side and a downstream side within said housing, means to admit a particle-air stream to the housing on the downstream side of said separation zone, and means to discharge a powder-air stream from which larger particles have been removed from the housing on the upstream side of the separation zone, the improvement comprising by-pass conduit means having an opening for receiving a portion of the powder-air stream extending into the downstream side of the separation zone and an opening for discharging said portion of the powder-air stream with the powder-air stream from which larger particles have been removed at the upstream side of said separation zone whereby a portion of the original powder-air stream by-passes the separation zone.

4,071,442

METHOD AND APPARATUS FOR RECOVERY OF ALUMINUM FROM SOLID WASTE

Booker W. Morey, Pasadena, Calif., assignor to Occidental Petroleum Corporation, Los Angeles, Calif.

Filed Aug. 11, 1975, Ser. No. 603,869
Int. Cl.[2] B03C *1/22*
U.S. Cl. 209—212 **6 Claims**

1. A process for separating non-magnetic conductive materials from a comminuted particulate trash mixture, comprising the steps of:

a. transferring the particulate trash mixture to a first transport line formed of a first group of serially aligned conveyor belts each having an upper belt portion and causing, by operating each successive conveyor belt at a higher linear velocity than the previous conveyor belt, the mixture to undergo stage wise increased in linear velocity to disperse the particles of trash during travel on said first transport line;

b. subjecting the travelling dispersed particulate trash mixture to a transverse moving magnetic force field formed by at least one linear motor positioned below the upper belt portion of the conveyor belt of the first group having the highest linear velocity, to transversely withdraw and concentrate the non-magnetic conductive particles in a separate fraction;

c. transferring the separated fraction to a second transport

line formed of a second group of serially aligned conveyor belts each having an upper belt portion and dispersing the particles of the fraction on said second transport line by stage wise increases in linear velocity of the conveyor belts of the second group;

d. subjecting the dispersed fraction of the second transport line to a second transverse moving magnetic force field, formed by at least one additonal linear motor positioned below the upper belt portion of the conveyor belt of the second group having the highest linear velocity, to selectively and transversely remove and further concentrate the non-magnetic conductive particles; and

e. returning the remaining particles not removed by the second moving magnetic force field to the first transport line.

4,071,443

REGULATING OXYGEN INPUT IN TREATMENT OF EFFLUENT

Theodor Gorski; Adolf Heinen, and Kurt Mack, all of Wuppertal, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed July 30, 1976, Ser. No. 709,977
Claims priority, application Germany, Aug. 12, 1975, 2535837
Int. Cl.[2] C02C *1/08*
U.S. Cl. 210—7 **1 Claim**

1. In the introduction of a finely dispersed gas containing at least about 20% of oxygen by volume with intensive mixing into a vessel having a gas space and effluent containing biochemically oxidizable constituents, in the presence of activated sludge particles, the improvement which comprises

a. introducing oxygen into the gas space of said vessel in such amount that the oxygen content is from about 40 to 80% by volume,

b. a component volume of the gases in the gas space being ejected as a fine dispersion into the effluent,

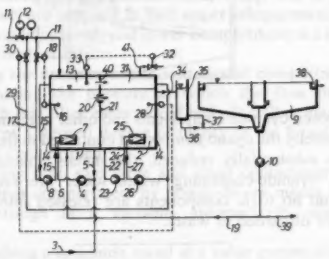
c. directly introducing oxygen into the effluent in such

amount that the oxygen content in the effluent is from about 1 to 4 mg/l,

d. forwarding effluent from said vessel to a second vessel having a gas space and establishing an oxygen content of about 30 to 60% by volume in said second vessel gas space,

e. ejecting a component volume of the gases in the second vessel gas space as a fine dispersion into the effluent in said second vessel,

f. directly introducing oxygen into the effluent of said sec-



ond vessel in such amount that the oxygen content in the effluent therein is from about 4 to 8 mg/l, and

g. recycling partially treated effluent in an amount ranging from about 10 to 300% by volume of fresh effluent and ejecting them together,

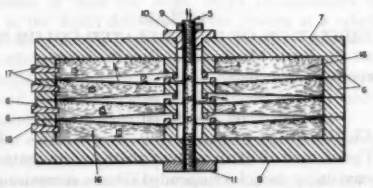
h. the conditions of ejection in (b) and (e) being such that the activated sludge particles are sub-divided to from about ½ to 1/20 their normal size due to the action of shear forces, whereby there is obtained an improved utilization of oxygen even in the event of fluctuations in load of the effluent.

4,071,444

PORTABLE CHEMICAL REACTOR FOR USE AS AN ARTIFICIAL KIDNEY

Stephen R. Ash, Lafayette; Philip G. Wilcox, and David P. Kessler, both of West Lafayette, all of Ind., assignors to Purdue Research Foundation, West Lafayette, Ind.

Filed Oct. 12, 1976, Ser. No. 731,826
Int. Cl.² B01D *31/00*
U.S. Cl. 210—22 A **11 Claims**



1. A dialysis device, comprising a sealed outer casing which is divided internally by at least one flexible membrane into at least one chamber adapted to receive blood, and at least one other chamber adapted to receive dialysis material,

a blood flow passage directly connected to said one chamber to provide blood flow in one direction into said one chamber through said blood passage and to provide blood flow in the opposite direction away from said one chamber through said blood passage,

pressure control means connected to said other chamber,

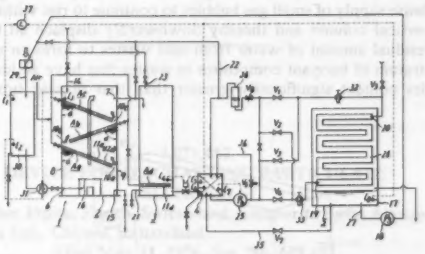
whereby decreasing the pressure in said other chamber causes blood to be drawn into said one chamber through said blood passage, and increasing the pressure in said other chamber causes blood to be forced out of said one chamber through said blood passage.

4,071,445

METHOD AND APPARATUS FOR TREATING WASTE WATER ON SHIPS

Sakae Katayama, Kobe; Sadaoki Kanada, Ibaragi; Michitake Kamata, Takatsuki; Yasuhiro Sakaguchi, Yokohama, and Katsumi Kojima, Saitama, all of Japan, assignors to Daicel, Ltd., Sakai and Katayama Chemical Works Co., Ltd., Osaka, both of, Japan

Filed Mar. 22, 1976, Ser. No. 668,904
Claims priority, application Japan, Apr. 12, 1975, 50-44577
Int. Cl.² B01D *13/00*
U.S. Cl. 210—23 H **11 Claims**



1. A method of treating waste water on a ship comprising the steps of passing waste water through a coarse mesh filter and a crushing means; causing the filtered waste water to flow upward; passing the waste water through a plurality of downwardly slanting open cellular plate-like members projecting alternately from a pair of opposed walls defining a passage for the upward flow of the waste water, with a small space provided between the free end of each of the plate-like members and the wall opposed thereto, while causing large suspended solids to be separated from the waste water and accumulated in a concentrated state beneath each of the plate-like members by flotation with bubbles generated in the interior of each of the plate-like members to thereby reduce suspended solids in the waste water to below 1,000 ppm and clarifying the resulting treated water by passing the treated water through a semipermeable membrane.

4,071,446

METHOD FOR REGENERATION OF WEAK ACID CATION EXCHANGE RESIN

Robert Kunin, Yardley, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed June 21, 1976, Ser. No. 698,459
Int. Cl.² B01D *15/06*
U.S. Cl. 210—32 **1 Claim**

1. A process for regenerating a weak acid cation exchange resin comprising contacting the resin with a solution of 70 to 80 weight percent alkali metal chloride, about 5 to 15 percent alkali metal carbonate and the balance alkali metal chelating polycarboxylate.

4,071,447

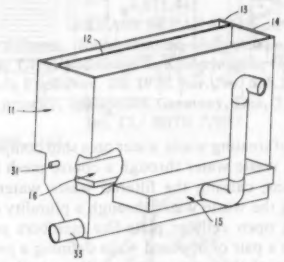
DEWATERING OF WASTEWATER TREATMENT WASTES

Ernest R. Ramirez, Lemont, Ill., assignor to Swift & Company, Chicago, Ill.

Continuation-in-part of Ser. No. 568,382, April 16, 1975, abandoned. This application Sept. 1, 1976, Ser. No. 719,438
Int. Cl.² C02C *3/00*; B03D *1/00*
U.S. Cl. 210—44 **20 Claims**

1. A process for dewatering wastewater treatment wastes such as skimmings or sludges, comprising: supplying wastewater treatment wastes of water and buoyant or precipitated impurities that had been previously coagulated during a primary treatment of the wastewater; entering said wastewater

treatment wastes into a lower portion of a vertical column, said entering step being downwardly through a vertical zone; spreading said wastes at the lowermost portion of said vertical zone; passing a dense supply of small gas bubbles from a source lower than said lowermost portion of the vertical zone upwardly through said spread wastes; upwardly feeding a polymer flocculant at a location lower than said lowermost portion of the vertical zone and above the source of bubbles; permitting said spread wastes to contact said gas bubbles and floc to thereby form buoyant composites with the previously coagulated impurities within said wastes, confining said composites within said column, said confining step enhancing vertical movement of water and composites while limiting their horizontal movement; dewatering said wastes by permitting said dense supply of small gas bubbles to continue to rise within the vertical column and thereby downwardly displace all but a residual amount of water from said wastes to form an upper stratum of buoyant composites in wastes that have an impurities content significantly greater than that of said supplied



wastes and a lower stratum of substantially clarified water; and separating said upper stratum and said lower stratum.

14. An apparatus for dewatering primary wastewater treatment wastes such as skimmings or sludges, comprising: a vertical chimney; a vertical inlet means opening into said chimney for introducing primary wastewater treatment wastes into the lower portion of the chimney; bubble supply means within said chimney and below said vertical inlet means; an injector located below said vertical inlet means and above said bubble supply means; a deflecting means communicating with said vertical inlet means for spreading said wastes into extensive contacting relationship with bubbles from said bubble supply means and with polymer flocculant supplied through said injector; an efflux means that is in communication with a vertical side of said chimney at a location below said bubble supply means, the horizontal distance between said vertical inlet means and said efflux means being less than the height of the vertical chimney; and said efflux means has a maximum height at least as high as the height of the wastes in the chimney.

4,071,448

METHOD FOR TREATMENT OF CYANIDE-CONTAINING WASTE WATER

Hiroo Watanabe, Hujisawa; Kunihiko Toyoshima; Masaru Noutomi, both of Yokohama, and Kouichi Yamakawa, Hujisawa, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

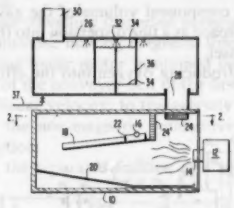
Continuation-in-part of Ser. No. 394,802, Sept. 6, 1973, abandoned. This application Dec. 1, 1975, Ser. No. 636,657

Claims priority, application Japan, Sept. 18, 1972, 47-92933; Nov. 30, 1972, 47-119364; Jan. 29, 1973, 48-11177

Int. Cl.[2] C02C *5/04*

U.S. Cl. 210—50 **2 Claims**

1. A method for treating a cyanide-containing waste water which comprises mixing said waste water with formaldehyde in an amount of from 1.0 to 1.3 mols per mol of cyano component contained in said waste water, and immediately subjecting said mixture to treatment at a temperature of from 300 ° to 1200° C. in an atmosphere containing oxygen in an amount sufficient to provide an oxygen content in the exhaust gases within the range of from 2 to 11% by volume to evaporate water and volatile materials from the mixture and decompose the cyanide-containing components thereof and to burn said



decomposed cyanide components and other combustible materials whereby the cyano component contained in the exhausted gases is substantially reduced, the metals contained in the original cyanide-containing waste water are recovered as solids and no toxic components are released into the atmosphere or discarded as waste.

4,071,449

PROCESS FOR TREATMENT OF WASTE WATER EXHAUSTED FROM WATER-WASH SPRAY BOOTH USING WATER-SOLUBLE PAINT

Tuyosi Inoue, Kakogawa; Masao Kimura, Itami, and Humikazu Matuda, Kobe, all of Japan, assignors to Nippon Paint Co., Ltd., Japan

Continuation of Ser. No. 658,664, Feb. 17, 1976, abandoned. This application Apr. 15, 1977, Ser. No. 787,941

Claims priority, application Japan, Feb. 19, 1975, 50-21331

Int. Cl.[2] C02B *1/20*

U.S. Cl. 210—53 **7 Claims**

1. A process for the treatment of waste water containing a water-soluble paint in uncoagulated form which comprises alternately adding an acidic agent and an alkaline agent to said water to form an insoluble or slightly soluble salt in said water, while keeping said water at a pH value in the range of about 6 to 9, so as to cause the water-soluble paint to be deposited as a non-adhesive coagulation product and eliminating said non-adhesive product from the waste water so treated by liquid-solid separation, said acidic and alkaline agent being added in an amount effective to substantially coagulate said paint.

4,071,450

PRECIPITATION OF IRON RELATED COLOR BODIES

Stewart N. Paul, Mississauga, Canada, assignor to Chemed Corporation, Cincinnati, Ohio

Filed Dec. 13, 1976, Ser. No. 749,625

Int. Cl.[2] C02B *1/20*

U.S. Cl. 210—53 **8 Claims**

1. The method of clarifying iron waste waters containing red iron-containing particles suspended therein comprising adding thereto an effective amount of a dye selected from the group consisting of basic blue and green dyes, thereby to flocculate the particles, and recovering a clarified correspondingly blue or green tinted water.

4,071,451

LIQUID FILTRATION SYSTEM

Norman E. Wood, Rochester, N.Y., assignor to The French Co., Webster, N.Y.

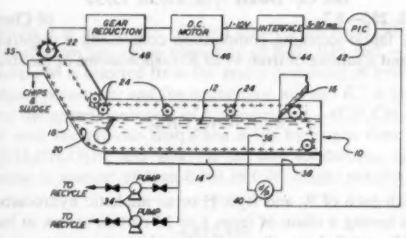
Continuation-in-part of Ser. No. 675,295, April 9, 1976, abandoned. This application Jan. 31, 1977, Ser. No. 764,019

Int. Cl.[2] B01D *37/00, 35/16*

U.S. Cl. 210—79 **8 Claims**

1. A filtration process for purifying contaminated liquid used in machining operations comprising:

a. supplying contaminated liquid to an upper compartment of a filtration tank having a liquid permeable filter element separating said upper compartment from a substantially vacuum-tight lower compartment;
b. said liquid containing both large, bulky contaminants which provide minimal resistance to flow of liquid through said filter element when deposited thereon, and small, compactible contaminants which provide resistance to flow of liquid through said filter element in proportion to the depth of the bed of said small contaminants deposited thereon;
c. determining the volumetric rate at which said large contaminants are supplied to said upper compartment;
d. pumping liquid from said lower compartment at a substantially constant rate;
e. sensing the pressure within said second compartment;
f. determining the pressure at which the flow of liquid through said filter element and bed of small contaminants produces a desired degree of clarity of the liquid in said second compartment;
g. removing both said large and small contaminants from said upper compartment by power-driven means moving therethrough at a variable, automatically controlled speed;
h. establishing a minimum speed at a value greater than zero sufficient to remove said large contaminants in accordance with the volumetric rate of supply thereof, irrespective of said pressure; and
i. increasing the speed from said minimum value in response to a decrease of said pressure below that determined to



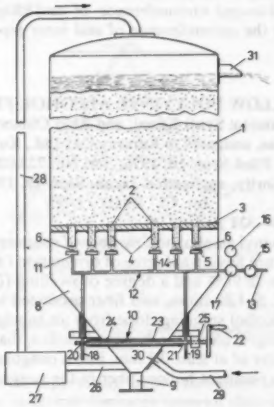
provide said desired degree of clarity, irrespective of the rate of supply of said large contaminants.

6. A filtration system for removing from a liquid used in machining operations both large, bulky and small, compactible contaminants, at least the large, bulky contaminants being supplied in the liquid delivered to the system at a relatively constant, determinable volumetric rate, said system comprising, in combination:
a. a single tank having an upper compartment adapted to receive contaminated liquid arranged directly above a substantially vacuum-tight lower compartment;
b. a filter element separating said upper and lower compartments for drainage of liquid from the former to the latter with contaminants being retained in said upper compartment, the large contaminants presenting little resistance to flow of liquid through said filter element irrespective of the accumulation thereof and the small contaminants presenting a resistance to such flow proportional to the accumulation of small contaminants on said filter element;
c. pump means for evacuating liquid from said lower compartment at a substantially constant rate, thereby creating a pressure differential between said upper and lower compartments having a magnitude proportional to the resistance to flow of liquid through said filter element and thereby to the depth of the bed of small contaminants thereon;
d. movable, power-driven means for removing contaminants from said upper compartment;
e. means for sensing said pressure differential; and
f. control means establishing the speed of movement of said movable means, said control means having a first set point establishing the minimum speed of movement at a value greater than zero sufficient to remove large contaminants in accordance with said volumetric rate of supply thereof irrespective of said pressure differential and a second set point for increasing the speed of movement above said minimum value in response to increase of said pressure differential above a predetermined value, as determined by the accumulation of small contaminants on said filter element irrespective of the rate of supply of large contaminants.

4,071,452
DEVICE FOR DISCHARGING PARTICULATE MATERIALS

Gunther Friese, Zurich, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed May 21, 1976, Ser. No. 688,612
Claims priority, application Switzerland, May 28, 1975, 6817/75
Int. Cl.² B01D *41/02*
U.S. Cl. 210—189 **7 Claims**



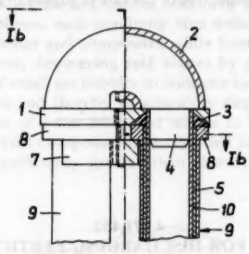
1. A device for controlling the discharging of particulate material, comprising, in combination:
a container including a bottom for storing said materal;
a pluraity of outlet ports defined in said bottom for the discharge of said material;
receiving means disposed below each of said outlet ports and operable for receiving and accumulating a sufficient amount of the discharged material to block controllably the continued discharge of said material from said outlet ports;
fluid expulsion means associated with each of said receiving means and being controllably operable to eject a fluid under pressure into the accumulating material for restraining the accumulation of said material on said receiving means and
movable support means connected to said receiving means, whereby the position of said receiving means with respect to said outlet ports can be adjusted within a predetermined range of settings.

4,071,453

DIAPHRAGM FILTRATION SYSTEM

Günter Koslowski, Kirchhellen, Germany, assignor to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Oct. 7, 1976, Ser. No. 730,522
Claims priority, application Germany, Oct. 11, 1975, 2545716
Int. Cl.[2] B01D *13/00*
U.S. Cl. 210—232 **3 Claims**



1. In a diaphragm filtration system including a pipe; a filtering diaphragm supported substantially coaxially within the pipe and lying, at least indirectly, tightly against the inner pipe wall as filtration proceeds in a radially outward direction; the improvement wherein said diaphragm is a sheet member bent cylindrically and having liquid impervious, unbonded overlapping surfaces; the cross section of said diaphragm being an annulus having overlapping ends and a non-continuous area and the end-to-end circumference of said diaphragm being greater than the circumference of said inner pipe wall.

4,071,454

HOLLOW POLYVINYL ALCOHOL FIBERS

Kohzo Yamamoto; Syuji Kawai, and Akio Ohmori, all of Kurashiki, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Sept. 10, 1976, Ser. No. 722,024
Claims priority, application Japan, Sept. 19, 1975, 50-113276
Int. Cl.[2] B01D *13/00*
U.S. Cl. 210—321 A **2 Claims**

1. A polyvinyl alcohol hollow fiber of substantially homogeneous structure having a degree of orientation (π) in the range of $60\% \leqq \pi \leqq 98\%$ and a degree of swelling (ζ) in the range of $1.05 \leqq \zeta \leqq 1.80$ times, said fiber produced by extruding a polyvinyl alcohol spinning dope from an annular nozzle, said nozzle having a clearance between orifice diameter and its outer diameter of at least 0.3 mm, into a coagulation bath, and drawing the resultant hollow fiber in the coagulation bath.

4,071,455

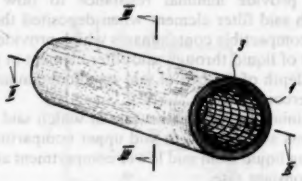
FILTER ELEMENT AND METHOD OF MAKING THE SAME

Eitel Fritz Haver, Oelde, Germany, assignor to Haver & Boecker, Oelde, Germany

Filed Aug. 5, 1976, Ser. No. 711,875
Claims priority, application Germany, Sept. 17, 1975, 2541383
Int. Cl.[2] B01D *29/20*
U.S. Cl. 210—497.1 **31 Claims**

1. A method of making a filter, comprising the steps of providing at least one material which is capable of being sintered and which has apertures of a predetermined size, convoluting the material to form a hollow filter body which is composed of a plurality of superimposed layers, each having a plurality of said apertures; sintering said hollow body at a temperature which is below the melting point of said material so as to bond said superimposed layers together without substantially altering the size of the apertures therein and thereby produce a filter having a predetermined uniform filtration capability over its entire filter surface area.

14. A filter element, comprising a multilayered hollow filter body having a predetermined uniform filtration capacity over its entire filter surface area, said filter body comprising a plurality of convolutions of at least one material which has apertures of a predetermined size, and convolutions being sintered



together without substantial alteration in the size of said apertures; and at least one reinforcing element for said filter body, said reinforcing element having apertures which are at least as large as those of said convoluted material.

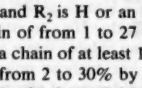
4,071,456

FABRIC-SOFTENING COMPOSITIONS

Thomas McGee, and David William Roberts, both of Wirral, England, assignors to Lever Brothers Company, New York, N.Y.

Filed Nov. 6, 1974, Ser. No. 516,943
Claims priority, application United Kingdom, Oct. 23, 1973, 49295/73
Int. Cl.[2] D06M *7/02, 13/30, 13/32*
U.S. Cl. 252—8.7 **10 Claims**

1. A fabric-softening composition comprising a dispersing agent and a sultone of from 14 to 30 carbon atoms of the structure



in which each of R_1 and R_2 is H or an aliphatic hydrocarbon radical having a chain of from 1 to 27 carbon atoms, at least one of R_1 and R_2 has a chain of at least 10 carbon atoms, and n is 1 or 2, containing from 2 to 30% by weight of sultone and from 0.2 to 200 parts of sultone being present to 1 part by weight of dispersing agent; where the dispersing agent includes a detergent-active compound comprising an olefin sulfonate, the composition contains 1–20 parts of detergency builder per 1 part by weight of the detergent-active compound.

4,071,457

OIL RECOVERY PROCESS USING VISCOSIFIED SURFACTANT

John J. Meister, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 654,435, Feb. 2, 1976, Pat. No. 4,007,792. This application Sept. 30, 1976, Ser. No. 728,377
Int. Cl.[2] E21B *43/22, 43/26;* **C09K** *7/02*
U.S. Cl. 252—8.55 D **2 Claims**

1. A process for recovering oil from subterranean formations comprising

A. injecting into the formation via at least one injection well, a composition of matter comprising in admixture:
   a. a fluid consisting essentially of
      10–90 weight percent of water,
      90–10 weight percent of chloroform,
   b. 1–5000 ppm of a cationic surfactant,
   c. 1–5000 ppm of an anionic surfactant,
   d. 50–20,000 ppm acid in a quantity sufficient to reach a pH of $\leqq 4.5$ in the aqueous phase, and
   e. 50–20,000 ppm buffer salt in mol ratio of buffer salt to: acid component d in the range of 0.1:1 to 5:1,

the ppm values being based on the combined weight of water and chloroform,

B. moving the composition through the formation towards at least one production well, so that said composition displaces the oil in the formation toward said production well or wells, and

C. recovering oil and at least a portion of said composition from said production well or wells.

4,071,458
OIL DISPLACEMENT FLUID CONTAINING A SOLUBILIZING AGENT

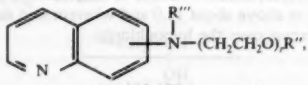
Joseph C. Allen, Bellaire, Tex., assignor to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 645,185, Dec. 29, 1975, abandoned, which is a division of Ser. No. 560,425, March 20, 1975, abandoned. This application Sept. 17, 1976, Ser. No. 724,184

Int. Cl.[2] E21B *43/22, 43/24*

U.S. Cl. 252—8.55 D **6 Claims**

1. An oil-displacement fluid which comprises a material selected from the group consisting of water, steam and superheated steam together with a minor amount of a solubilizing agent of the formula:



wherein r is an integer of from about 5 to about 50; R″ is selected from the group consisting of hydrogen and $-SO_3M$ wherein M is selected from the group consisting of hydrogen, sodium, potassium, and the ammonium ion and R‴ is selected from the group consisting of hydrogen and $-(CH_2CH_2O)_rR''$ and with the proviso that when R″ is hydrogen then R‴ is $-(CH_2CH_2O)_rH$; and wherein the said solubilizing agent is present in amount of from 0.001 to 0.05 weight percent.

4,071,459
ALKYL-GUANIDINO-HETEROCYCLIC COMPOUNDS, THEIR MANUFACTURE AND USE AS ADDITIVES FOR FUELS AND LUBRICANTS

Choua Cohen, and Bernard Sillion, both of Grenoble, France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

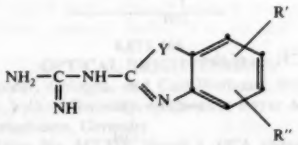
Filed Aug. 29, 1975, Ser. No. 608,966

Claims priority, application France, Sept. 10, 1974, 74 30819

Int. Cl.[2] C10M *1/32*

U.S. Cl. 252—50 **17 Claims**

1. An alkyl-guanidino heterocyclic compound produced by alkylation at 100°-250° C. with a halogenated hydrocarbon of the general formula RX_n, of a guanidino-heterocyclic compound (A) of the formula:



in which R is a hydrocarbon radical containing about 10 to 200 carbon atoms, X is a halogen atom and n is 1 or 2; Y is —NH—, R′ and R″ are each a hydrogen atom, or an alkyl radical having from 1 to 10 carbon atoms, or a —Z—Ar group in which Z is —O—, —S—, or alkylene and Ar is aromatic hydrocarbyl or R′ and R″ together, when they are in ortho position, represent a carbocyclic ring fused to the benzene ring, the proportion of the reactants being 0.7–2.5 moles of (A) per gm. atom of halogen in RX_n.

9. A lubricating composition comprising a major amount of a mineral oil, and in a sufficient proportion to obtain dispersing properties at least one compound according to claim 1.

4,071,460
LUBRICANTS COMPRISING DIALKANOLAMINE DERIVATIVES

Robert P. Pardee, Boulder, Colo., assignor to Ball Brothers Research Corporation, Boulder, Colo.

Filed Sept. 10, 1976, Ser. No. 722,175

Int. Cl.[2] C10M *1/32*

U.S. Cl. 252—51.5 R **14 Claims**

1. A composition for imparting wear resistance to a surface having dynamic presentations thereon consisting essentially of a solution of an essentially nonvolatile N-alkyl-substituted N,N-dialkanolamine in an amount ranging from about 1.0 to about 0.001 weight percent and a volatile carrier selected from the group consisting of alcohols, ketones, esters, halogenated hydrocarbons and hydrocarbons.

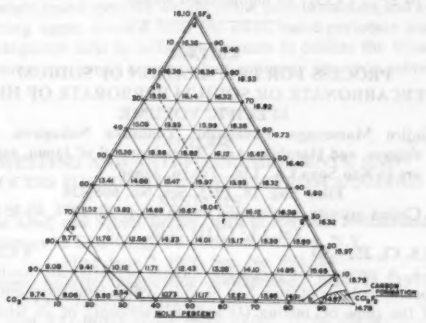
4,071,461
GASEOUS DIELECTRIC MIXTURES FOR SUPPRESSING CARBON FORMATION

Whitney H. Mears, Buffalo, and Sabatino R. Orfeo, Orchard Park, both of N.Y., assignors to Allied Chemical Corporation, Morris Township, N.J.

Continuation-in-part of Ser. No. 589,496, June 23, 1975, abandoned. This application July 28, 1976, Ser. No. 709,343

Int. Cl.[2] H01B *3/56*

U.S. Cl. 252—63.5 **29 Claims**



1. A process for suppressing carbon formation in a dielectric fluid during an electrical discharge from an electrical conductor which comprises contacting the electrical conductor during operation with a gaseous dielectric mixture consisting essentially of at least one halogenated alkane plus one member selected from the group consisting of CO_2, in an amount of at least 15 mole percent, and a combination of SF_6 and CO_2 which, when plotted on a ternary diagram in mole percent of SF_6-CO_2-halogenated alkane, lies in regions rich in SF_6 and CO_2 defined by a line having at its extremities the points defined by

1 SF_6 - 15 CO_2 - 84 halogenated alkane

10 SF_6 - 1 CO_2 - 89 halogenated alkane,

said halogenated alkane containing from 1 to 4 carbon atoms and at most one hydrogen atom, with the remaining hydrogen atoms replaced by at least one halogen selected from the group consisting of fluorine, chlorine and bromine, and having a vapor pressure of at least about 100 torr at 20° C.

14. A process for suppressing carbon formation in a dielectric fluid during an electrical discharge from an electrical conductor which comprises contacting the electrical conductor during operation with a gaseous dielectric mixture consisting of a mixture selected from the group consisting of

a. 40 to 80 mole percent of SF_6, balance CCl_2F_2;
b. 75 to 85 mole percent of SF_6, balance $CClF_3$;
c. 60 to 85 mole percent of SF_6, balance $CBrF_3$;
d. 40 to 50 mole percent of SF_6, balance $CHClF_2$;
e. 25 to 90 mole percent of SF_6, balance $CClF_2CF_3$;
f. a composition within an area on a ternary diagram defined by a polygon having at its corners the points defined by
45 SF_6 - 5 CHF_3 - 50 $CHClF_2$
49 SF_6 - 1 CHF_3 - 50 $CHCF_2$
98 SF_6 - 1 CHF_3 - 1 $CHClF_2$
94 SF_6 - 5 CHF_3 - 1 $CHClF_2$;
g. a composition within an area on a ternary diagram defined by a polygon having at its corners the points defined by
30 SF_6 - 55 CCl_2F_2 - 15 $CClF_2CF_3$
30 SF_6 - 1 CCl_2F_2 - 69 $CClF_2CF_3$
98 SF_6 - 1 CCL_2F_2 - 1 $CClF_2CF_3$
44 SF_6 - 55 CCl_2F_2 - 1 $CClF_2CF_3$; and
h. a composition within an area on a ternary diagram defined by a polygon having at its corners the points defined by
30 SF_6 - 15 $CClF_3$ - 55 $CClF_2CF_3$
30 SF_6 - 1 $CClF_3$ - 69 $CClF_2CF_3$
98 SF_6 - 1 $CClF_3$ - 1 $CClF_2CF_3$
84 SF_6 - 15 $CClF_3$ - 1 $CClF_2CF_3$.

15. A carbon formation suppressant composition consisting essentially of at least one halogenated alkane plus both SF_6 and CO_2, said halogenated alkane containing from 1 to 4 carbon atoms and at most one hydrogen atom, with the remaining hydrogen atoms replaced by at least one halogen selected from the group consisting of fluorine, chlorine and bromine, and having a vapor pressure of at least about 100 Torr at 20° C, said composition, when plotted on a ternary diagram, lying in the regions rich in SF_6 and CO_2 defined by a line having at its extremities the points defined by
1 SF_6 - 15 CO_2 - 84 halogenated alkane
10 SF_6 - 1 CO_2 - 89 halogenated alkane.

4,071,462
PROCESS FOR PREPARATION OF SODIUM PERCARBONATE OR SODIUM PERBORATE OF HIGH SPECIFIC VOLUME

Kinjiro Matsunaga, Funabashi; Yunosuke Nakagawa, Koshigaya, and Haruhiko Arai, Narashino, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Aug. 18, 1975, Ser. No. 605,426
Claims priority, application Japan, Aug. 20, 1974, 49-95235
Int. Cl.² C11D *7/38, 7/18*
U.S. Cl. 252—99 **9 Claims**

1. A process for preparing sodium percarbonate having a specific volume of from 5 to 10 cc/g, which consists essentially of the steps of: mixing (1) sodium carbonate or an aqueous solution of sodium carbonate, with (2) an aqueous solution of hydrogen peroxide, wherein at least one of said solutions has dissolved therein a water-soluble anionic organic surfactant selected from the group consisting of the sodium, potassium, ammonium and alkylol ammonium salts of higher fatty acids or resin salts containing about 8 to 20 carbon atoms; alkyl benzene sulfonates, alkyl phenol sulfonates and alkyl naphthalene sulfonates in which the alkyl group has from 8 to 18 carbon atoms; olefin sulfonates, hydroxyalkane sulfonates and mixtures thereof obtained from olefins having 8 to 25 carbon atoms; alkyl sulfonates and disulfonates in which the alkyl group has from 10 to 20 carbon atoms; salts of higher fatty acids having 8 to 20 carbon atoms esterified with isethionic acid; sulfates of higher alcohols having 8 to 18 carbon atoms; sulfates of mono- or di-glycerides of higher (C_{10} - C_{18}) fatty acids; polyoxyethylene alkyl ether sulfates containing 1 to 6 moles of ethylene oxide and in which the alkyl contains from 8 to 18 carbon atoms; polyoxyethylene alkylphenol ether sulfates containing 1 to 10 moles of ethylene oxide and in which the alkyl contains 8 to 12 carbon atoms; and sulfates of alkanolamides of higher fatty acids having 12 to 18 carbon atoms, wherein the concentration of said surfactant in the mixture of (1) and (2) is higher than the critical concentration for micelle formation of said surfactant and is less than about 5 percent by weight, based on the weight of said mixture, whereby to precipitate crystals of sodium percarbonate; and recovering said crystals of sodium percarbonate from said mixture.

4,071,463
STABLE CLEANING AGENTS OF HYPOCHLORITE BLEACH AND DETERGENT

Alfred F. Steinhauer, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 612,414, Sept. 11, 1975, abandoned. This application May 24, 1976, Ser. No. 689,271
Int. Cl.² C11D *7/54*
U.S. Cl. 252—103 **8 Claims**

1. A liquid cleaning formulation consisting essentially of an aqueous solution of (1) from 0.5 weight percent up to its limit of aqueous solubility of a synthetic detergent selected from the group consisting of (a) a water soluble alkali metal alkyl sulfate wherein said alkyl group is a straight chain moiety containing from about 6 to 20 carbon atoms, or (b) a water soluble branched chain alkyl aryl sulfonate wherein the alkyl group contains from 8 to 18 carbon atoms, or (c) water soluble mixtures thereof, (2) not more than one weight percent of said formulation of sodium hypochlorite and (3) a sufficient amount of a water soluble alkaline builder to maintain the pH of said formulation at above about 11.0 and wherein said detergent is present in excess over the hypochlorite.

4,071,464
USES OF METHYLENE PHOSPHONATES OF POLY-DIEPOXIDIZED POLYALKYLENE POLYAMINES

Patrick M. Quinlan, Webster Groves, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 148,216, May 28, 1971, Pat. No. 4,035,412. This application Jan. 31, 1977, Ser. No. 764,252
Int. Cl.² C02B *5/06*
U.S. Cl. 252—180 **10 Claims**

1. A process of inhibiting the formation of scale in aqueous systems which comprises adding to the aqueous system a scale inhibiting amount of methylene phosphonates of poly-diepoxidized polyalkylene polyamines having

1. nitrogen-bonded methylene phosphonate units of the formula $-CH_2PO(OM)_2$ where M is alkali metal, alkaline earth metal, hydrogen, amine-derived ammonium or ammonium,
2. at least one unit of the formula

$$-CH_2-\underset{\displaystyle OH}{\underset{|}{CH}}-$$

and
3. at least one unit of the formula

$$-\underset{\displaystyle OH}{\underset{|}{CH}}-CH_2-,$$

the $-CH_2-$ of the

$$-CH_2-\underset{\displaystyle OH}{\underset{|}{CH}}-$$

unit (2) being bonded to one terminal nitrogen of the polyalkylene polyamine and the $-CH_2-$ of the

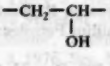
$$-\underset{\displaystyle OH}{\underset{|}{CH}}-CH_2-$$

unit (3) being bonded to the other terminal nitrogen of the polyalkylene polyamine, the poly-diepoxidized polyalkylene polyamine being the reaction product of polyalkylene polyamine and diepoxide.

6. The process of chelating metal ions in an aqueous system which comprises adding to the aqueous system a chelating amount of methylene phosphonates of poly-diepoxidized polyalkylene polyamines having

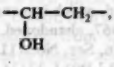
1. nitrogen-bonded methylene phosphonate units of the formula $-CH_2PO(OM)_2$ where M is alkali metal, alkaline earth metal, hydrogen, amine-derived ammonium or ammonium,

2. at least one unit of the formula

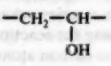


and

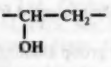
3. at least one unit of the formula



the $-CH_2-$ of the



unit (2) being bonded to one terimal nitrogen of the polyalkylene polyamine and the $-CH_2-$ of the



unit (3) being bonded to the other terminal nitrogen of the polyalkylene polyamine, the poly-diepoxidized polyalkylene polyamine being the reaction product of polyalkylene polyamine and diepoxide.

4,071,465

DEEP-RED EMITTING PHOSPHOR

Frank M. Vodoklys, Wayne, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 18, 1977, Ser. No. 788,209
Int. Cl.[2] C09K *11/38*
U.S. Cl. 252—301.4 F **3 Claims**

1. A luminescent composition which can be excited to luminescence by ultraviolet or by visible wavelength radiations of deep violet or green to emit in the deep red, said composition consisting essentially of $Al_2O_3{:}xGeO_2{:}yCr$, wherein "*x*" is from about 0.012 to about 0.20 and "*y*" is from about 0.006 to about 0.035.

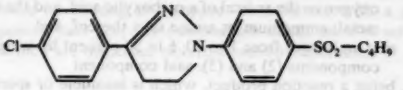
4,071,466

OPTICAL BRIGHTENERS

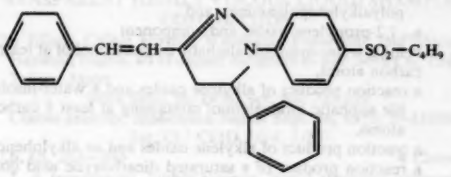
Josef Schroeder, Cologne, and Carl-Wolfgang Schellhammer, Schildgen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 447,211, March 1, 1974, abandoned. This application Jan. 13, 1976, Ser. No. 648,658
Claims priority, application Germany, Mar. 2, 1973, 2310446; Mar. 2, 1973, 2352245
Int. Cl.[2] D06L *3/12*
U.S. Cl. 252—301.22 **2 Claims**

1. Process for brightening of synthetic macromolecular substances by treating said substances with a mixture of 95–10 percent by weight of a compound of the formula



with the remaining 5–90 percent by weight of a compound of the formula



2. Process of claim 1 wherein said macromolecular substance is a cellulose ester spinning composition.

4,071,467

SELF-COMPLEXING GALACTOMANNAN GUMS

Robert Nordgren, Minneapolis, Minn., assignor to General Mills Chemicals, Inc., Minneapolis, Minn.

Filed Nov. 1, 1976, Ser. No. 737,814
Int. Cl.[2] B01J *13/00*
U.S. Cl. 252—316 **3 Claims**

1. A self-complexing blend consisting essentially of galactomannan gum, a water-soluble antimony salt in which the antimony ion is trivalent in amounts of from about 0.40 to 1.75% by weight based upon the weight of the galactomannan, and an oxidizing agent selected from the alkali metal periodate and permanganate salts in sufficient amounts to oxidize the trivalent antimony ion to a pentavalent antimony ion upon solvation.

4,071,468

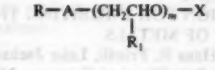
WETTING AND ANTI-FOAMING AGENTS, AND PROCESS FOR REMOVING FOAM FROM AQUEOUS SYSTEMS

Heinz Abel, and Alfred Berger, both of Reinach, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed June 7, 1976, Ser. No. 693,584
Claims priority, application Switzerland, June 13, 1975, 7695/75; Oct. 7, 1975, 13011/75
Int. Cl.[2] B01D *19/04*; B01F *17/02, 17/16, 17/54*
U.S. Cl. 252—321 **32 Claims**

30. A process for removing foam from aqueous systems which comprises incorporating into the aqueous system 0.001 to 20 grams per liter of a wetting and antifoaming agent which contains

1. 2 to 50 percent by weight of an anionic surfactant of the formula



wherein

R is an aliphatic hydrocarbon radical of 8 to 22 carbon atoms or a cycloaliphatic or aliphatic-aromatic hydrocarbon radical of 10 to 22 carbon atoms,

R_1 is hydrogen or methyl,

A is —O— or

X is the acid radical of an inorganic acid which contains oxygen or the radical of a carboxylic acid, and the alkali metal, ammonium or amine salts thereof, and

m is an integer from 1 to 20; 6 to 50 percent by weight of components (2) and (3), said component

2. being a reaction product, which is insoluble or sparingly soluble in water, with a molecular weight of approximately 2000 to 7000, of

a_1. monohydric to hexahydric alcohols containing 1 to 6 carbon atoms, monoalkyl- or monoalkylolamines or polyalkylenepolyamines, and

a_2. 1,2-propylene oxide, and component

3. being a water-insoluble aliphatic monoalcohol of at least 8 carbon atoms,

a reaction product of alkylene oxides and a water-insoluble aliphatic monoalcohol containing at least 8 carbon atoms,

a reaction product of alkylene oxides and an alkylphenol,

a reaction product of a saturated dicarboxylic acid containing 3 to 10 carbon atoms and 1,2-propylene oxide or polypropylene glycols,

a reaction product of a fatty acid containing 10 to 18 carbon atoms and 1,2-propylene oxide or polypropylene glycols,

a reaction product of a fatty acid containing 10 to 18 carbon atoms, a trihydric to hexahydric alcohol and 1,2-propylene oxide,

or

a reaction product of a fatty acid containing 10 to 18 carbon atoms, a polyalkylenepolyamine and 1,2-propylene oxide,

and wherein the weight ratio of component (2) to component (3) is (10 to 2):1,

4. 0 to 30 percent by weight of an organopolysiloxane silicone oil which is optionally blocked with hydroxyl, and

5. 2 to 92 percent by weight of water.

4,071,469

SOLVENT COMPOSITION FOR USE IN CARBONLESS COPY SYSTEMS

David N. Vincent, Glenview, and Cheng Hsiung Chang, Naperville, both of Ill., assignors to Champion International Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 353,809, April 23, 1973, abandoned. This application Aug. 26, 1974, Ser. No. 500,903

Int. Cl.² B01F *1/00*

U.S. Cl. 252—364 **18 Claims**

1. A solvent composition for use in carbonless copy systems in the absence of a halogenated solvent, wherein said solvent consists essentially of a combination of a mono-alkyl naphthalene, wherein said alkyl group contains from 1 to 3 carbon atoms per molecule, and a di-alkyl naphthalene, wherein each of said alkyl groups in said di-alkyl naphthalene contains from 2 to 4 carbon atoms per molecule, said mono-alkyl naphthalene being present in an amount between about 25 and about 40% by weight of the alkylated naphthalenes present in said solvent.

4,071,470

METHOD AND COMPOSITION FOR INHIBITING THE CORROSION OF METALS

Jerry R. Davidson, Clute, and Hans R. Friedli, Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed July 15, 1976, Ser. No. 705,738

Int. Cl.² C09K *3/00*

U.S. Cl. 252—389 R **5 Claims**

1. In a method for inhibiting the corrosion of metals in contact with a circulating absorbent medium, which is used for removal of acid-gases from natural or synthetic gas streams wherein the circulating, rich absorbent is heated in order to release the acid-gases, the resulting lean absorbent is contacted with the acid-gas containing gas stream, the improvement which consists of introducing into the said medium, a product derived by reacting monoalkanolamine at from about 21° to about 100° C, with sulfur or a sulfide and an oxidizing agent, along with copper or a copper salt, sulfide or oxide, for from 0.1 to about 20 hours, until the resulting mixture is stable when diluted with water, said sulfur or sulfur compounds being present, based on sulfur, in a ratio of 3 to about 30 parts by weight per part of copper; and, in an amount of from 1 to about 40 percent by weight of the total composition, said product being added to the absorbent medium in an amount which maintains at least 0.00002 pounds each of copper and 0.0002 pounds of sulfur per pound of medium per day.

4,071,471

CATALYSTS FOR CONVERSION OF OLEFINS

Robert L. Banks, and Joseph R. Kenton, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 535,299, Dec. 23, 1974, Pat. No. 3,996,166, which is a division of Ser. No. 205,350, Dec. 6, 1971, Pat. No. 3,865,751, which is a division of Ser. No. 6,045, Jan. 26, 1970, Pat. No. 3,660,506, which is a continuation of Ser. No. 678,499, Oct. 27, 1967, abandoned, which is a continuation-in-part of Ser. No. 627,668, April 3, 1967, abandoned. This application Aug. 2, 1976, Ser. No. 711,027

Int. Cl.² B01J *27/24, 27/02*

U.S. Cl. 252—437 **8 Claims**

1. A composition active for converting an olefin to obtain the product of the olefin reaction which, as defined herein, can be visualized as comprising the reaction between two first pairs of carbon atoms, the two carbon atoms of each first pair being connected by an olefinic double bond, to form two new pairs from the carbon atoms of said first pairs, the two carbon atoms of each of said new pairs being connected by an olefinic double bond comprising magnesium oxide admixed with a separate disproportionation catalyst selected from the group consisting of

1. one or more of the group aluminum phosphate, zirconium phosphate, calcium phosphate, magnesium phosphate or titanium phosphate promoted by one or more of a sulfide of molybdenum or tungsten, or an oxide or compound convertible to the oxide by calcination of molybdenum, tungsten or rhenium, or magnesium tungstate or beryllium phosphotungstate; and

2. silica, alumina, aluminum phosphate, zirconium phosphate, calcium phosphate, magnesium phosphate, or titanium phosphate promoted by hexacarbonyl of molybdenum or tungsten;

said magnesium oxide being present in an amount in the range of 0.1 to 20 parts by weight per part by weight of said disproportionation catalyst.

4,071,472

CATALYST FOR THE PURIFICATION OF EFFLUENT GASES CONTAINING OXIDES OF NITROGEN AS IMPURITY

Michel Sénés, La Baule; Yannick Le Goff, and Jean-Francois Gourdier, both of Saint Nazaire, all of France, assignors to Societe Chimique de la Grande Paroisse, Azote et Produits Chimiques, Paris, France

Filed Jan. 30, 1976, Ser. No. 653,831

Claims priority, application France, Feb. 4, 1975, 75 03430

Int. Cl.² B01J *21/04, 21/12, 23/10, 23/74*

U.S. Cl. 252—455 R **10 Claims**

1. A catalyst for use in the removal of oxides of nitrogen from effluent gas consisting essentially of (a) 96–99.5% by weight of an oxide of at least one of the metals iron, chromium and vanadium, (b) a promoter selected from the group consisting of an oxide of at least one rare earth metal, present in an amount of 4–0.5% by weight, said catalyst having a specific surface within the range of 20–100 m^2/gm and having the pores therein with a maximum dimension within the range of 100–5000 A, said catalyst being prepared by the thermal de-

composition of an intimate mixture of the nitrate of at least one of the metals iron and chromium and, when vanadium is to be present, of vanadium pentoxide powder and a water-soluble form of one of the said promoters, said thermal decomposition taking place in a series of steps the first of which is effected at substantially 200° C for substantially 1 hour, each succeeding heating step taking place at a temperature substantially 50° C higher than the preceding step and lasting substantially 1 hour with the final heating step taking place at substantially 600° C and lasting substantially 1 hour.

4,071,473
PREPARATION AND USE OF HIGH SURFACE AREA TRANSITION METAL CATALYSTS

Gary B. Atkinson, and Larry J. Nicks, both of Reno, Nev., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Nov. 3, 1976, Ser. No. 738,201
Int. Cl.² B01J *21/04, 23/10, 23/76*
U.S. Cl. 252—462 **11 Claims**

1. A method for preparing a catalyst which comprises:

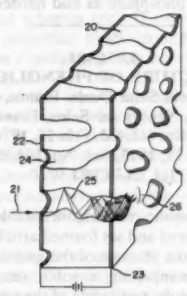
a. forming an alloy of a first metal selected from the group consisting of nickel, cobalt, iron and mixtures thereof with a second metal selected from the group consisting of yttrium, the rare earth metals and mixtures thereof, said first metal comprising from 5 to 95 wt-pct of said alloy; and

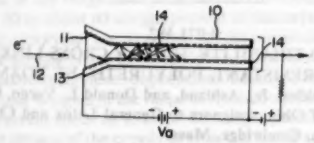
b. reacting said alloy with a gas comprising hydrogen and carbon monoxide at a temperature sufficiently high for a time sufficiently long to oxidize said second metal.

4,071,474
SECONDARY-ELECTRON MULTIPLIER DYNODE

Yoshio Kishimoto, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 14, 1975, Ser. No. 621,794
Claims priority, application Japan, Oct. 14, 1974, 49-119085; Nov. 19, 1974, 49-133969
Int. Cl.² H01B *1/04*
U.S. Cl. 252—500 **14 Claims**





1. In a dynode for a secondary electron multiplier having a dynode support or substrate made of an electrically insulating material and a secondary electron emissive and electron conductive layer formed upon a surface of said support or substrate the improvement which comprises forming said electron emissive and electron conductive layer from a high polymer composition emitting more secondary electrons than primary electrons by coating said support or substrate with a paint comprising said polymer composition dissolved in a solvent into which are dispersed electro-conductive particles.

4,071,475
TRANSPARENT HIGHLY VISCOUS LIQUID SHAMPOO COMPOSITION

Eiji Iijima, Chiba; Hiroshi Watanabe, Funabashi, and Shizuo Hayashi, Sugito, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Sept. 10, 1976, Ser. No. 722,129
Claims priority, application Japan, Sept. 16, 1975, 50-111860
Int. Cl.² C11D *1/14, 1/83*
U.S. Cl. 252—545 **4 Claims**

1. A transparent, highly viscous, liquid shampoo composition consisting essentially of

A. from about one to about 10 weight percent of one or a mixture of compounds having the formula

$$R_1-\underset{\displaystyle R_2}{\underset{|}{CH}}-O-(CH_2CH_2O)_nH$$

wherein R_1 is alkyl having 8 to 14 carbon atoms, R_2 is hydrogen or alkyl having one to 7 carbon atoms, and wherein

1. n is a number of from zero to one, for from zero to 10 weight percent of the total weight of component A,
2. n is a number of from 2 to 4, for from 90 to 100 weight percent of the total weight of component A, with the proviso that n is 3 for from 50 to 100 weight percent of the total weight of component A, and
3. n is a number of 5 or more, for from zero to 10 weight percent of the total weight of component A;

B. from about 5 to about 40 weight percent of alkyl (C_{11} to C_{13}) sulfate alkylolamine (C_2 to C_3) salt, and

C. the balance is essentially water.

4,071,476
DETERGENT BUILDERS AND COMPOSITION CONTAINING THE SAME

John A. Patterson, Fishkill, N.Y., assignor to Texaco Inc., New York, N.Y.

Division of Ser. No. 437,252, Jan. 28, 1974, Pat. No. 4,039,464.
This application Sept. 30, 1976, Ser. No. 728,095
Int. Cl.² C11D *3/20, 3/34*
U.S. Cl. 252—557 **2 Claims**

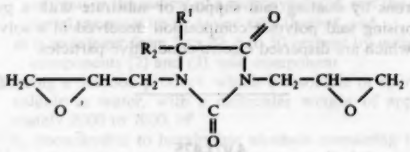
1. A detergent builder selected from the group consisting of sodium carboxymethyl phthalate, sodium carboxymethyl tetrahydrophthalate, sodium carboxymethyl hexahydrophthalate, sodium carboxymethyl maleate and sodium sulfoethyl maleate.

4,071,477
HYDANTOIN DIGLYCIDYL COMPOUNDS

Raymond Seltzer, New City, and David A. Gordon, Scarsdale, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed June 10, 1976, Ser. No. 694,741
Int. Cl.² C08G *59/26;* C07D *233/78*
U.S. Cl. 260—2 N **10 Claims**

1. A hydantoin diglycidyl compound of the formula



wherein R_1 is hydrogen, alkyl containing 1 to 8 carbon atoms or cycloalkyl containing 5 to 6 carbon atoms; and R_2 is alkyl containing 5 to 8 carbon atoms or cycloalkyl containing 5 to 6 carbon atoms.

8. A curable composition comprising a diglycidyl hydantoin compound of claim 1 and a curing agent for epoxy resins.

4,071,478

CONTROLLED PARTIALLY CROSS-LINKED 3,3-IONENES

Tsung-Ying Shen, Westfield, and Arthur F. Wagner, Princeton, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed June 7, 1976, Ser. No. 693,589
Int. Cl.[2] C08G *73/02*
U.S. Cl. 260—2 R **15 Claims**

1. The process which comprises reacting a poly-[(methylimino)trimethylene] polymer with about 1% to 20% of the stoichiometric equivalent (based on the tertiary amine content of the polymer) of 1,3-dihalopropane or 2-hydroxy-1,3-dihalopropane, thereby forming a partially (1% to 20%) cross-linked, partially-quaternized polymeric mixture, wherein nitrogen atoms in adjacent poly-[(methylimino)trimethylene] linear chains are, by quaternization, joined through trimethylene or 2-hydroxy-trimthylene bridges; and reacting the said partially cross-linked, partially quaternized polymeric mixture with an excess of alkyl halide or trialkylammoniopropyl halide, thereby quaternizing any residual tertiary amine groupings present in the said polymeric mixture to form the corresponding substantially completely quaternized, 1% to 20% (1,3-trimethylene or 2-hydroxy-1,3-trimethylene)-cross-linked, poly-[(alkyl-methyliminio)trimethylene halide] or poly-[{methyl-(3-trialkylammoniopropyl)iminio}trimethylene dihalide].

4,071,479

RECLAMATION PROCESSING OF VINYL CHLORIDE POLYMER CONTAINING MATERIALS AND PRODUCTS PRODUCED THEREBY

Barret Broyde, Decatur; Judith Archer Delles, Duluth, and Steven Forrest North, Chamblee, all of Ga., assignors to Western Electric Company, Inc., New York, N.Y.

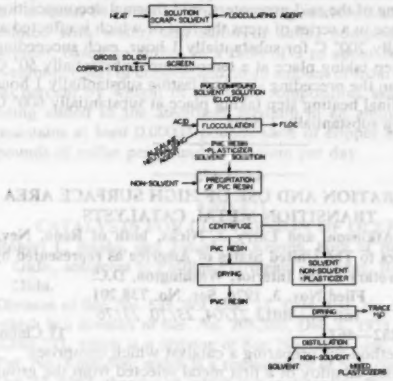
Filed Mar. 25, 1976, Ser. No. 670,469
Int. Cl.[2] C08J *11/00, 11/02, 11/04*
U.S. Cl. 260—2.3 **26 Claims**

1. A process for recovering a reusable essentially pure vinyl chloride polymer resin from a polymer mixture which comprises plasticized polyvinyl chloride and insoluble particulate additives, which includes the steps of:

contacting a polymer mixture which comprises plasticized polyvinyl chloride and insoluble particulate additives with a solvent for vinyl chloride polymers to form a solvent mixture comprising a solvent solution of dissolved vinyl chloride polymer and plasticizers and insoluble particulate additives in suspension;

treating the solvent mixture with at least an acid which is selected from the group consisting of an inorganic acid and an inorganic acid solution and which is substantially soluble in the solvent to flocculate and remove the suspended particulate additives; and

treating the solvent solution with a non-solvent which is miscible with the solvent in substantially all proportions



and which is a solvent for the plasticizer to precipitate an essentially pure vinyl chloride polymer resin therefrom.

4,071,480

HARDENER FOR PRODUCTION SOLID FOAMS OR COMPACT STRUCTURE FROM AQUEOUS SOLUTIONS

Jakob Rademachers, Krefeld, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 23, 1974, Ser. No. 463,640
Claims priority, application Germany, May 10, 1973, 2323488
Int. Cl.[2] C08J *9/14*
U.S. Cl. 260—2.5 F **8 Claims**

1. In the production of foams or compact materials by adding an acidic hardener to an aqueous system containing a resin selected from the group consisting of urea-formaldehyde and thiourea-formaldehyde component capable of being hardened thereby, and allowing said system to set to a hardened mass, the improvement which comprises employing about 3 to 15% by weight of boron phosphate as said hardener.

4,071,481

MANUFACTURE OF PHENOLIC FOAM

Daniel Hanton, Estrees Saint Denis, France, assignor to Saint-Gobain Industries, Neuilly-sur-Seine, France

Continuation of Ser. No. 445,433, Feb. 25, 1974. This application July 11, 1975, Ser. No. 594,956
Int. Cl.[2] C08J *9/10*
U.S. Cl. 260—2.5 F **36 Claims**

1. A foamable phenolic resin mixture stable at room temperature from which cured and set foamed articles may be formed by heating alone in the absence of the addition of an agent for setting the resin, comprising a solid, reactive, heat-fusible water-insoluble phenolic resol resin of the resol type in particulate form, a blowing agent, and a surfactant, said mixture being devoid of any agent for setting the resin.

4,071,482

REDUCED-FRIABILITY, HIGHLY CROSS-LINKED, FLAME-RESISTANT, POLYURETHANE FOAMS

Henry S. Hopkins, Jr., Ashland, and Donald L. Vargo, Columbus, both of Ohio, assignors to General Latex and Chemical Corporation, Cambridge, Mass.

Filed Oct. 27, 1976, Ser. No. 735,883
Int. Cl.[2] C08G *18/14*
U.S. Cl. 260—2.5 AJ **15 Claims**

1. An improved, rigid, cross-linked, polyurethane foam characterized by ASTM E-84 flame-spread values of 25 or less and low smoke-generation values of 400 or less, and having improved friability properties, which foam comprises the reac-

tion product of a polyisocyanate and a halogenated polyether polyol having a hydroxyl number of about 300 to 600 and a functionality of three to eight, the reaction carried out in the presence of a catalyst and a blowing agent, and which foam contains from about 1 to 10% by weight of a liquid C_2–C_6 alkylene carbonate having a boiling point of greater than about 230° C.

4,071,483

POLYSILOXANE-POLYOXYALKYLENE BLOCK COPOLYMERS AS STABILIZERS IN THE PRODUCTION OF URETHANE FOAM

Carl James Litteral, Marietta, Ohio, and David Lee Mullins, Williamstown, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 507,998, Sept. 20, 1974, Pat. No. 3,980,688. This application July 1, 1976, Ser. No. 701,669

Int. Cl.² C08G *18/14*

U.S. Cl. 260—2.5 AH **23 Claims**

1. A process for preparing flexible polyether polyurethane foam, said process comprising reacting and foaming a mixture comprising (a) a polyether containing at least two hydroxyl groups per molecule, (b) an organic polyisocyanate, (c) a catalyst for the reaction of (a) and (b) to produce the polyurethane, (d) a blowing agent and (e) as the foam stabilizer a polysiloxane-poly(oxyethylene-oxypropylene) block copolymer consisting essentially of from about 15 to about 35 percent by weight of polysiloxane blocks and from about 85 to about 65 percent by weight of polyoxyalkylene blocks, and further consisting essentially of siloxy units of the formula R_2SiO, siloxy units selected from the group consisting of those of the formulas (R)(Q)SiO and RSiO3/2 and terminal siloxy units selected from the class consisting of those of the formulas $R_3SiO1/2$ and (R_2) (Q)SiO1/2, wherein the average number of total siloxy units per molecule of the polysiloxane-polyoxyalkylene block copolymer ranges from about 20 to about 200, wherein from about 6 to about 15 percent of said total siloxy units are selected from the group consisting of (R)(Q)SiO and (R_2) (Q)SiO1/2 and wherein there are no more than about four RSiO3/2 siloxy units per average polysiloxane molecule, wherein each R individually represents a monovalent hydrocarbon radical or a substituted monovalent hydrocarbon radical, said radicals being free from aliphatic multiple carbon to carbon bonds, and wherein each Q individually represents a polyoxyalkylene polyether block having the formula —MX wherein each M is a bridging group individually selected from the class consisting of —O— and $-C_nH_{2n}O-$ wherein *n* has a value of 2 or 3, and X is a polyoxyalkylene radical consisting essentially of an admixture of Units A and B of the formula $(C_2H_4O)_x(C_3H_6O)_yZ$ wherein Z is a terminal group selected from the class consisting of alkyl, aryl and aralkyl radicals, with the proviso that when M is $-C_nH_{2n}O-$ as defined above, Z can also be a terminal acyl radical, the values of *x* and *y* being determined by the following conditions prevailing for Units A and B;

Unit A representing from about 20 to about 80 percent by weight of low molecular weight polyoxyalkylene polyether based on the total weight of Units A and B in said admixture; said polyether being selected from the class consisting of (i) a polyoxyalkylene copolymer having an average molecular weight in the range of from about 800 to about 2300 wherein about 20 to about 60 weight percent of the oxyalkylene groups of said copolymer are oxyethylene, the remainder of the oxyalkylene groups being oxypropylene, and (ii) a blend of at least two polyoxyalkylene copolymers having different average molecular weights in the range of from about 500 to about 2900 and wherein about 20 to about 60 weight percent of the oxyalkylene groups of the copolymers in said blend are oxyethylene, the remainder of the oxyalkylene groups being oxypropylene, with the proviso that said blend has an average molecular weight in the range of from about 800 to about 2300; and

Unit B representing from about 80 to about 20 percent by weight of high molecular weight polyoxyalkylene polyether based on the total weight of Units A and B in said admixture said polyether being selected from the class consisting of (i) a polyoxyalkylene copolymer having an average molecular weight in the range of from about 3400 to about 5500 wherein about 20 to about 60 weight percent of the oxyalkylene groups of said copolymer are oxyethylene, the remainder of the oxyalkylene groups being oxypropylene, and (ii) a blend of at least two polyoxyalkylene copolymers having different average molecular weights in the range of from about 3000 to about 5500 and wherein about 20 to about 60 weight percent of the oxyalkylene groups of the copolymers in said blend are oxyethylene, the remainder of the oxyalkylene groups being oxypropylene, with the proviso that said blend has an average molecular weight in the range of from about 3400 to about 5500; and with the added proviso that said admixture of Units A and B has an average molecular weight in the range of from about 1600 to about 2900.

4,071,484

PROCESS FOR PREPARING FLEXIBLE FLAME RETARDING POLYURETHANE FOAMS

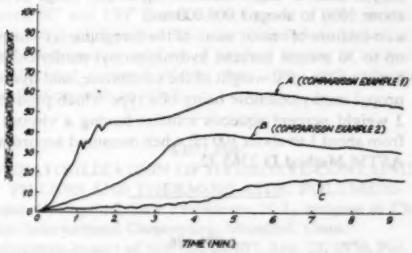
Yasumasa Sawachika, Ashikaga, and Hiroshi Kawakami, Tanuma, both of Japan, assignors to Kohkoku Chemical Industry Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 618,170, Sept. 30, 1975, abandoned, which is a continuation of Ser. No. 464,620, April 26, 1974, abandoned. This application July 7, 1976, Ser. No. 703,219

Claims priority, application Japan, Oct. 23, 1973, 48-119201

Int. Cl.² C08G *18/78*

U.S. Cl. 260—2.5 AT **7 Claims**



1. A process for preparing unshrinking flexible and flame retarding polyurethane foams, comprising mixing;

A. diisocyanate mixture which contains 80 to 45% by weight of diisocyanate and 20 to 55% by weight of urethane-modified diisocyanate obtained by reacting

A-1. one mole of a dihydroxyl aromatic compound selected from the group consisting of 1,2-dihydroxybenzene, 1,3-dihydroxybenzene, 2,4-dihydroxytoluene, 2,2′-dihydroxydiphenyl, 4,4′-dihydroxydiphenyl, 2,2′-dihydroxybenzophenone and 3,3′-dihydroxydiphenylmethane with

A-2. 4 to 15 moles of diisocyanate at a temperature from 80° C to 130° C for 3 to 35 hours

B. a polyhydroxyl compound having at least two active hydrogen atoms and a molecular weight between 1000 and 10000, at least 10% by weight thereof being primary hydroxyl,

C. a foaming agent, and

D. a catalyst, and foaming and curing the thus obtained foam in the conventional manner.

4,071,485

FOUNTAIN SOLUTIONS AND FOUNTAIN CONCENTRATES FOR LITHOGRAPHIC PRINTING COMPRISING AQUEOUS SOLUTIONS OF POLYACRYLAMIDE BASED POLYMERS, AND BLENDS OF POLYACRYLAMIDE AND POLYACRYLIC ACID

Walter L. Garrett, Freeland, and Ralph G. Czerepinski, Midland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 586,451, June 12, 1975, abandoned, which is a continuation-in-part of Ser. No. 565,916, April 7, 1975, abandoned. This application Sept. 27, 1976, Ser. No. 727,320

Int. Cl.[2] C08L *1/28*

U.S. Cl. 260—17 R 45 Claims

1. An aqueous solution for rendering hydrophilic, the non-image areas of an image-bearing lithographic printing plate which comprises: water; a phosphate compound selected from the group consisting of (1) alkali metal phosphates, ammonium phosphate, and mixtures thereof, and (2) phosphoric acid; and an active polymer component selected from the group consisting of

a. a polyacrylamide-based polymer wherein from about 3 to about 70 percent of the carbonyl sites are carboxyl groups and the balance of said sites are amide moieties,

b. a physical blend comprised of from about 97 to about 30 weight per cent polyacrylamide and from about 3 to about 70 weight percent polyacrylic acid or an alkali metal or ammonium salt thereof,

c. a physical blend comprised of polyacrylamide, or polyacrylic acid or an alkali metal or ammonium salt thereof, and at least one polyacrylamide-based polymer as described in (a), said polymers being employed in proportions such that of the total carbonyl sites present in the blend, from about 3 to about 70 percent are carboxyl groups and the balance are amide moieties

d. a mixture of any two or more of the foregoing (a) - (c), the weight average molecular weight of each of said polyacrylamide-based polymer, polyacrylamide, and polyacrylic acid or salt thereof being in the range of from about 5000 to about 1,000,000 and

e. a co-mixture of one or more of the foregoing (a) - (d) with up to 30 weight percent hydroxypropyl methylcellulose based on the total weight of the co-mixture, said hydroxypropyl methylcellulose being of a type which produces a 2 weight percent aqueous solution having a viscosity of from about 1 to about 100 cP when measured according to ASTM Method D 2363-72.

4,071,486

EPOXIDE THERMAL STABILIZATION ADDITIVE FOR POLYPYRROLIDONE

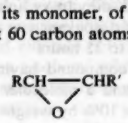
Phillip H. Parker, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Dec. 20, 1976, Ser. No. 752,502

Int. Cl.[2] C08J *3/20*

U.S. Cl. 260—18 N 16 Claims

1. A composition of matter comprising a major amount of normally solid poly-2-pyrrolidone and a thermal stabilizing amount, effective to reduce the thermal degradation of said poly-2-pyrrolidone to its monomer, of an alkyl epoxide, containing less than about 60 carbon atoms, of the formula



wherein R is hydrogen, alkyl or epoxyalkyl and R′ is alkyl, polyalkylene oxide, epoxyalkyl, epoxypolyalkyl oxide, alkylester, epoxyalkylester, hydroxyalkyl or hydroxyalkylester.

4,071,487

ANTI-SETTLING AGENTS FOR PIGMENTED AQUEOUS LACQUER AND PROCESS FOR THE MANUFACTURE OF SAID AGENTS

Heinz Linden, Dusseldorf-Holthausen; Wolfgang Gress, Wuppertal-Elberfeld, and Wilhelm Offermann, Dusseldorf, all of Germany, assignors to Henkel KGaA, Dusseldorf, Germany

Filed Jan. 22, 1976, Ser. No. 651,476

Claims priority, application Germany, Jan. 27, 1975, 2503166

Int. Cl.[2] C09D *3/64, 5/02, 7/02*

U.S. Cl. 260—22 TN 23 Claims

1. A water-dispersible amine salt of the reaction product of a substantially neutral ester of a C_{14-20} ethylenically unsaturated fatty alcohol with an α, β-unsaturated-ethylenedicarboxylic acid with about 1/7 to 1/35 of its weight of an α, β-unsaturated ethylenedicarboxylic compound of acidic character, said reaction product being formed by heating said neutral ester and said ethylenedicarboxylic compound at 200° C. to 250° C. for about 1 to 25 hours; said ethylenedicarboxylic acid and said ethylenedicarboxylic compound each containing not more than six carbon atoms.

15. An aqueous lacquer comprising a water-soluble film-forming component, a pigment, and an effective amount of an amine salt according to claim 1 as agent inhibiting settling of said pigment.

4,071,488

LATEX COMPOSITION

George B. Freda, Belpre, Ohio, assignor to Uniroyal, Inc., New York, N.Y.

Filed Feb. 16, 1961, Ser. No. 89,881

Int. Cl.[2] C08L *91/00*

U.S. Cl. 260—23.7 A 2 Claims

1. A latex composition comprising 100 parts of a rubbery polymer selected from the group consisting of polybutadiene and copolymers of butadiene with up to 50% by weight of styrene, 30–60 parts of formamide, and 5–30 parts of N-(ethylene oxide substituted) amide of oleic acid containing about 10 moles of ethylene oxide per mole of amide, the said parts being by weight.

4,071,489

COATING COMPOSITIONS FROM DICYCLOPENTENYL ACRYLATE AND/OR METHACRYLATE

William D. Emmons, Huntingdon Valley; Kayson Nyi, Sellersville, and Peter R. Sperry, Doylestown, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Mar. 8, 1976, Ser. No. 665,017

Int. Cl.[2] C09D *3/66*

U.S. Cl. 260—22 CB 24 Claims

1. An autoxidizable composition adapted to be used for coating and/or impregnating a substrate consisting essentially of:

a. reactive non-volatile monomeric material selected from

1. a monomeric material consisting essentially of dicyclopentenyl acrylate or dicyclopentenyl methacrylate or a mixture thereof, such material being referred to generically by the term DCP(M)A, and

2. a monomeric material comprising a predominant proportion of DCP(M)A and a minor proportion of an ester of an aliphatic alcohol having 10 to 20 carbon atoms with acrylic acid or methacrylic acid;

b. a polyol-polycarboxylic acid alkyd or polyester resin having at least one unsaturated component selected from (1) maleic acid or anhydride or fumaric acid moieties and (2) drying or semi-drying oil moieties, said resin being formed from a polycarboxylic acid or anhydride, the alkyd being selected respectively from

1. alkyds in which the polycarboxylic acid precursor component comprises a dicarboxylic acid which is predominantly to exclusively an aliphatic dicarboxylic

acid or anhydride having at least 4 carbon atoms, this alkyd being used with reactive monomer (1) above, and

2. alkyds in which the polycarboxylic acid precursor component comprises a dicarboxylic acid which is predominantly to exclusively an aromatic dicarboxylic acid or anhydride, this alkyd being used with reactive monomer (2) above; and

c. an effective amount of a metal salt or complex drier or siccative.

4,071,490

PLASTICS FOIL FOR THE MANUFACTURE OF AUDIO-VISUAL INFORMATION CARRIERS

Hans-Joachim Andrascheck; Rainer Mücke; Werner Lorz, all of Burgkirchen (Alz); Heinz Borchard; Jürgen Buck, both of Nortorf; Herbert Knothe, Neumunster, and Bruno Rybka, Nortorf, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany.

Filed Sept. 8, 1976, Ser. No. 721,308

Claims priority, application Germany, Sept. 12, 1975, 2540654

Int. Cl.² C08L *91/00*

U.S. Cl. 260—23 XA **3 Claims**

1. Rigid polyvinyl chloride foil free from plasticizer and having modified impact resistance, suitable for the manufacture of audio-visual information carriers with stamped in spiral grooves carrying the information reproducible by pressure scanning characterized by the following properties:

a. a flow corresponding to a melt viscosity in the range of from 20 to 72 g/10 minutes,

b. a reduction in length of at most 20 % at 160° C,

c. a toughness corresponding to a factor of at least (25% . mm^2)/newtons in longitudinal and transverse directions

d. a surface resistance of at most 10^{10} ohms,

e. an elasticity corresponding to an elastic modulus in the range of from 2,500 to 5,000 newtons/mm^2,

f. a peak-to-valley height corresponding to a Perth-O-Meter value of less than 0.4 μm, and

g. a surface deposit corresponding to a foil extraction residue of less than 0.012% by weight.

4,071,491

ADHESIVE FORMULATION CONTAINING ISOBUTYLENE RUBBER

Dale C. Wiesman, Neenah, Wis., assignor to American Can Company, Greenwich, Conn.

Filed Apr. 29, 1977, Ser. No. 792,331

Int. Cl.² C08L *9/00*

U.S. Cl. 260—28.5 B **7 Claims**

1. As an adhesive formulation, an aqueous dispersion comprising, on a weight basis, about 45 to 55 parts of an isobutylene rubber, about 5.2 to 2.8 parts of an aliphatic hydrocarbon wax having a melting point of at least about 130° Fahrenheit, about 4.7 to 2.5 parts of a lower polyolefin, and water in an amount sufficient to provide 100 parts of said formulation, said dispersion having a viscosity of about 2,500 to 6,000 centipoises.

4,071,492

POLYURETHANE-UREA ELASTOMERS BASED ON PROPYLENE OXIDE-TETRAHYDROFURAN COPOLYMERS

Tristram Walker Bethea, Fairlawn, and Shingo Futamura, Seville, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Apr. 7, 1976, Ser. No. 674,459

Int. Cl.² C08G *18/32, 18/48;* C08K *5/12*

U.S. Cl. 260—31.8 R **18 Claims**

1. A polyurethane-urea elastomer, comprising,

the reaction product of propylene oxide-tetrahydrofuran copolymers, polyisocyanates and aromatic diamine chain extenders, said copolymers having a molecular weight of from about 300 to about 10,000 and containing from about 5 percent to about 75 percent of propylene oxide based upon the total weight of said copolymer,

said copolymers containing hydroxyl end groups,

said polyisocyanates reacted with said hydroxyl terminated copolymers to form prepolymers having isocyanate end groups, the equivalent ratio of said isocyanate groups of said polyisocyanates to said hydroxyl end groups ranging from about 1.25 to about 3.0,

said aromatic diamines having from 6 to about 20 carbon atoms and selected from the class consisting of shielded aromatic diamines and non-shielded aromatic diamines,

said prepolymer containing said isocyanate end groups chain extended through either bulk polymerization by reaction with said shielded aromatic diamines or through a solution polymerization by reaction with said non-shielded diamines to produce said polyurethane-urea elastomers, the equivalent ratio of amine groups of said aromatic diamines to said isocyanate end groups ranging from about 0.8 to about 1.2,

said copolymer containing hydroxyl end groups having a low viscosity,

said polyurethane-urea elastomers having good tensile strength at ambient temperatures and at 100° C, and good flex properties.

4,071,493

PRODUCTS WITH A FLUIDIFYING ACTION FOR MINERAL PASTES AND BINDERS

Patrick Begou, Moirans, France, assignor to Societe Chimique des Charbonnages, Paris, France

Filed Jan. 3, 1977, Ser. No. 756,407

Claims priority, application France, Jan. 2, 1976, 76 00027

Int. Cl.² C04B *7/02, 33/13;* C08K *3/00*

U.S. Cl. 260—42.13 **2 Claims**

1. A mineral paste or binder with increased fluidity said increased fluidity accomplished by inclusion of an alkali metal salt of a sulphonated styrene-indene hydrocarbon resin said resin prepared by polymerisation of an aromatic petroleum fraction, derived from vapor cracking, using a Friedel-Krafts catalyst, so as to yield a resin having a KS softening point between 60° and 150° C and a low degree of polymerisation, followed by sulphonation of the styrene-indene hydrocarbon resin in solution to produce a product having a content of unsulphonated material of less than 10%, with subsequent neutralization with an alkali.

4,071,494

COMPATIBILIZATION OF HYDROXYL-CONTAINING FILLERS AND THERMOPLASTIC POLYMERS

Norman G. Gaylord, New Providence, N.J., assignor to Champion International Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 66,107, Aug. 21, 1970, Pat. No. 3,956,230, which is a continuation-in-part of Ser. No. 702,204, Feb. 1, 1968, Pat. No. 3,645,939. This application Dec. 23, 1975, Ser. No. 643,820

The portion of the term of this patent subsequent to May 11, 1993, has been disclaimed.

Int. Cl.² C08K *9/04, 9/10*

U.S. Cl. 260—42.14 **28 Claims**

1. A process for compatibilizing a hydroxyl group containing inorganic filler with a thermoplastic polymer having labile atoms which provide sites for the formation of free radicals which comprises mixing said filler and said thermoplastic polymer in the presence of an ethylenically unsaturated carboxylic acid or anhydride and a free radical catalyst under conditions which will generate free radicals on the thermoplastic polymer and which will permit the acid or anhydride to react simultaneously with the thermoplastic polymer and the hydroxyl group containing filler, whereby said acid or anhydride reacts with and couples said thermoplastic polymer and said hydroxyl group containing filler to provide a filled thermoplastic polymer composition.

4,071,495

REINFORCED POLYVINYLIDENE FLUORIDE MOLDING COMPOSITIONS

Ernst-Joachim Stark, Troisdorf; Peter Vanhaiden, Bonn-Hersel, and Herbert Klinkenberg, Troisdorf-Eschmar, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed Feb. 24, 1977, Ser. No. 771,720
Claims priority, application Germany, Mar. 4, 1976, 2608898
Int. Cl.[2] C08K 7/14
U.S. Cl. 260—42.18 10 Claims

1. A reinforced polyvinylidene fluoride-containing composition comprising a polyvinylidene fluoride polymer and reinforcing glass fibers, said fibers having between 10 and 28 weight percent of basic oxides and up to 6 weight percent of boron oxide, the amount of boron oxide being no more than twice as great as the amount of alkali oxides contained in said basic oxides.

4,071,496

CARBON BLACK FOR LOW-HYSTERESIS RUBBER COMPOSITIONS

Gerard Kraus, and Harold R. Hunt, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 30, 1976, Ser. No. 681,977
Int. Cl.[2] C08K 3/04; C01B 31/00
U.S. Cl. 260—42.36 5 Claims

1. A carbon black having a tint residual of −6 or less and a tint in the range of about 70 to 100.

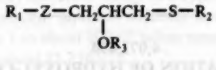
4,071,497

HINDERED HYDROXYPHENYLALKANOATES OF THIOETHER ISOPROPANOLS AND STABILIZED COMPOSITIONS

Martin Dexter, Briarcliff Manor, and David Herbert Steinberg, Bronx, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 532,127, Dec. 12, 1974, Pat. No. 3,954,839.
This application Jan. 14, 1976, Ser. No. 649,007
Int. Cl.[2] C08K 5/37
U.S. Cl. 260—45.85 B 12 Claims

1. A stabilized composition of matter comprising a polyolefin and from 0.01 to 5% by weight of a stabilizing compound of the formula

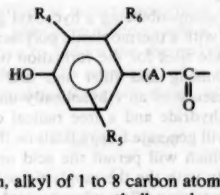


wherein

R_1 and R_2 are each independently alkyl of 1 to 30 carbon atoms, cycloaklyl of 5 to 12 carbon atoms, alkylthioethyl of 4 to 27 atoms in the chain or alkyl polyoxyalkylene of 4 to 27 atoms in the chain having the general structure $R^*(OC_nH_{2n})_h$ or $R^*(OCH_2CHR')_h$ where R^* is alkyl of 1 to 18 carbon atoms, n is 2 to 4, R' is hydrogen, methyl or ethyl and h is 1 to 3,

Z is oxygen or sulfur,

R_3 is the group



R_4 is hydrogen, alkyl of 1 to 8 carbon atoms, cycloakyl of 5 to 6 carbon atoms or α-methylbenzyl,

R_5 is alkyl of 1 to 8 carbon atoms or cycloalkyl of 5 to 6 carbon atoms,

R_6 is hydrogen or lower alkyl of 1 to 4 carbon atoms, or R_4 and R_6 together are a butylene chain which, together with the phenyl ring, form a tetrahydronaphthyl group, and provided when R_4 is hydrogen, R_6 is alkyl and R_5 is located on the carbon atom ortho to the hydroxyl group, and

A is a covalent carbon bond or a straight or branched lower alkylene having 1 to 8 carbon atoms.

4,071,498

METHOD OF CHAIN EXTENDING ORGANOSILOXANES

Cecil L. Frye, Midland, and Jerome M. Klosowski, Monitor Township, Bay County, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Dec. 29, 1975, Ser. No. 644,380
Int. Cl.[2] C08G 77/04
U.S. Cl. 260—46.5 G 3 Claims

1. A method of increasing the molecular weight of a hydroxyl endblocked polydiorganosiloxane having silicon-bonded hydroxyl radicals consisting essentially of mixing the polydiorganosiloxane wherein the organic groups are monovalent hydrocarbon radicals or monovalent halogenated hydrocarbon radicals and methylvinyldi-(epsiloncaprolactamo)silane, thereafter recovering a product polydiorganosiloxane having a molecular weight higher than the polydiorganosiloxane mixed with the silane and having methylvinylsiloxane units in the product polydiorganosiloxane.

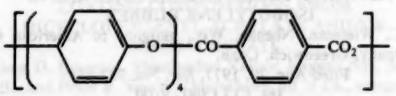
4,071,499

HIGH TEMPERATURE POLYESTER RESINS FROM 4,4'-BIS(P-HYDROXYPHENOXY)DIPHENYL ETHER AND TEREPHTHALIC ACID

Robert W. Stackman, Morristown, and Anthony B. Conciatori, Chatham, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Aug. 12, 1976, Ser. No. 713,722
Int. Cl.[2] C08G 63/18
U.S. Cl. 260—47 C 6 Claims

1. A polyester resin composition which consists essentially of the recurring structural unit:



4,071,500

PROCESS FOR RECOVERY OF CATALYST FROM POLYMERIZATION OF POLYPHENYLENE ETHERS

Glenn Dale Cooper, Delmar, and Daniel Edwin Floryan, Glenmont, both of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Dec. 13, 1976, Ser. No. 749,761
Int. Cl.[2] C08G 65/44, 65/45
U.S. Cl. 260—47 ET 23 Claims

1. In a process for forming a polyphenylene ether by an oxidative coupling reaction in the presence of a copper-amine complex catalyst comprising passing an oxygen-containing gas through a reaction solution of a phenol and said complex catalyst and terminating the reaction and separating the copper component of said catalyst by contacting the reaction solution with a chelating agent comprising an amino acid to form a chelated complex of copper and said chelating agent, the improvement which comprises separating the chelated complex from the reaction solution and contacting said chelated complex with at least 0.20 moles per mole of copper of a reducing sugar in an alkaline medium, said reducing sugar being selected from the mono-, di- or polysaccharides containing free alde-

hyde or keto groups not in glucoside combination with other molecules, to precipitate the copper in the form of an oxide.

4,071,501

WATER SOLUBLE ADDUCT OF HYDROXYMETHYL PHOSPHOROUS COMPOUND AND AMMONIA OR AMINE COMPOUND AND METHOD OF PREPARATION

Armand B. Pepperman, Jr., Metairie; Donald J. Daigle, New Orleans, and Sidney L. Vail, River Ridge, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 499,804, Aug. 22, 1974, Pat. No. 3,953,166. This application Jan. 14, 1976, Ser. No. 648,834

Int. Cl.² C08G 79/06

U.S. Cl. 260—67 R 2 Claims

1. A process for preparing a water soluble adduct polymer comprising:

a. reacting a hydroxymethyl phosphorus compound selected from the group consisting of tris(hydroxymethyl)phosphine and tetrakis (hydroxymethyl) phosphonium hydroxide with a nitrogenous compound selected from the group consisting of ammonia, hexamethylenetetramine, ethylenediamine and 1,6-hexamethylene diamine at a mole ratio of 1:4 to 4:1 of amine to phosphorus compound to form an insoluble polymeric precipitate; and

b. dissolving the precipitate from (a) in the presence of formaldehyde and an inorganic or organic acid with a mole ratio of 1:4 to 4:1 of formaldehyde to phosphorus contained in the precipitate and a 1:10 to 2:1 ratio of acid to phosphorus contained in the precipitate.

4,071,502

POLYESTER FIBER HAVING ANTI-PILLING PROPERTY AND ITS PRODUCTION

Hiroshige Sugiyama, and Hiroshi Yasuda, both of Otsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 415,473, Nov. 13, 1973, abandoned. This application Apr. 14, 1975, Ser. No. 568,535

Claims priority, application Japan, Nov. 14, 1972, 47-114559

Int. Cl.² C08G 63/70, 63/18

U.S. Cl. 260—75 T 5 Claims

1. An anti-pilling polyester fiber having an intrinsic viscosity of 0.32 to 0.48 as determined in a solvent mixture consisting of phenol and tetrachloroethane in a weight ratio of 6:4 at 30° C. which has the following physical properties:

Tenacity = 3.5 to 5.0 g/d;

Knot Tenacity = not more than 3.0 g/d;

Ratio of Tenacity to Knot Tenacity = not less than 1.5;

Birefringence = not less than 0.170; and

Tensile elongation at break = 10 to 20%.

4,071,503

POLYCARBODIIMIDE MODIFICATION OF POLYESTERS FOR EXTRUSION APPLICATIONS

Norman W. Thomas, Warren; Frank M. Berardinelli, Millington, both of N.J., and Robert Edelman, Staten Island, N.Y., assignors to Celanese Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 558,982, March 17, 1975, abandoned. This application Aug. 19, 1976, Ser. No. 715,946

Int. Cl.² C08G 63/46; B29C 5/06

U.S. Cl. 260—75 N 14 Claims

1. A process for preparing a polycarbodiimide modified thermoplastic polyester of increased melt strength and intrinsic viscosity as well as improved die swell and shear sensitivity, which process comprises incorporating into the structure of a thermoplastic saturated polyester, having at least one carboxyl end group, at least one polycarbodiimide which polycarbodiimide both (a) is derived from at least one aromatic diisocyanate which is either unsubstituted or contains up to one methyl substituent on each aromatic ring, and (b) contains at least three carbodiimide units per polycarbodiimide molecule, by reacting the carboxyl end group of the polyester, at a temperature not less than the melting point of the polyester and below the decomposition temperature of the polyester and the polycarbodiimide, with the carbodiimide groups of the polycarbodiimide, wherein the polycarbodiimide modified thermoplastic polyester has a melt strength of less than about 2.0 at 235° C, less than about 10 micro equivalents of carboxyl end groups per gram of polyester, an intrinsic viscosity of about 1.1 to about 2.5, and is useful in extrusion applications.

8. A polycarbodiimide modified thermoplastic polyester having a melt strength ratio of T_1/T_2 of less than about 2 wherein said polycarbodiimide modified thermoplastic polyester comprises the reaction product of (a) a thermoplastic saturated polyester, and (b) a polycarbodiimide which both (1) is derived from at least one aromatic diisocyanate which is either unsubstituted or contains up to one methyl substituent on each aromatic ring, and (2) contains at least three carbodiimide units per polycarbodiimide molecule which polycarbodiimide modified thermoplastic polyester is useful in extrusion applications.

4,071,504

PROCESS FOR PRODUCING LOW CARBOXYL POLYESTER FIBERS AND OTHER ARTICLES

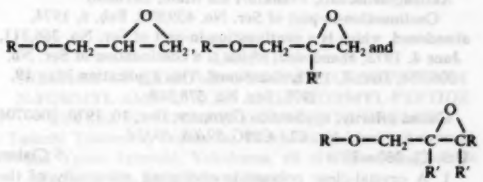
Gailerd L. Korver, Hartville, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 574,171, May 2, 1975, abandoned. This application Feb. 17, 1976, Ser. No. 658,315

Int. Cl.² D01F 1/00; C08G 51/36

U.S. Cl. 260—75 EP 8 Claims

1. In the process for producing textile and industrial fibers both multifilament and monofilament or molded articles by melt extruding a polyester resin, having an intrinsic viscosity of at least 0.4 as measured in a 60/40 phenol/tetrachloroethane or 50/50 trifluoroacetic acid/dichloromethane mixed solvent at 30° C. from melt spinning apparatus to form the desired article while adding to and reacting with said polyester resin, while in said apparatus for a period of from 1 to 6 minutes, at least one monofunctional epoxide of the formulas



where R is selected from the group consisting of alkyl, cycloalkyl, alkenyl, aryl, substituted aryl and aralkyl radicals and R′ is H or alkyl radical containing from 1 to 8 carbon atoms the improvement which comprises incorporating in said polyester resin prior to extrusion thereof at least one catalytic compound consisting of an alkali metal salt corresponding to the formula $R(COOM)_n$ where R is selected from the group consisting of hydrogen, hydroxyl radical, alkyl radicals containing from 1 to 20 carbon atoms and aryl radical, n is selected from 1 and M is selected from the group consisting of alkali metals and in the formula MX, X = hydroxyl, alkoxyl or halide, said catalytic compound being incorporated in an amount ranging from 0.01 to 10.0 parts by weight, based on the alkali metal, per 1000 parts by weight of the polyester.

4,071,505

MOLECULAR WEIGHT CONTROL OF POLYURETHANE ELASTOMERS

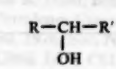
Walter Meckel, Neuss, Germany, and J. W. Britain, New Martinsville, W. Va., assignors to Mobay Chemical Corporation, Pittsburgh, Pa. and Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 490,528, July 22, 1974, abandoned, which is a continuation-in-part of Ser. No. 417,988, Nov. 21, 1973, abandoned, which is a continuation of Ser. No. 252,642, May 12, 1972, abandoned. This application Oct. 15, 1975, Ser. No. 622,594

Int. Cl.[2] C08G *18/30*

U.S. Cl. 260—77.5 MA 8 Claims

1. A process for producing elastomeric polyurethanes comprising reacting organic polyisocyanates with organic polyhydroxyl compounds having a molecular weight of from about 800 to about 5,000, containing at least two OH groups reactive with NCO groups such that the NCO/OH ratio is from about 0.9:1 to about 1.1:1 and incorporating into the reaction mixture a chain terminator having the general formula:



wherein R and R′ are the same or different and represent alkyl groups containing at least 3 carbon atoms which may be branched in the α- or β-positions, which may be substituted with halogen atoms, and which may contain hetero atoms in the form of esters or ethers, and wherein the chain terminator is present in an amount from about 0.1 percent to about 3 percent based on the molecular equivalent of all available OH groups.

4,071,506

CRYSTAL-CLEAR POLYAMIDES FROM 1,3-BIS(AMINOMETHYL)CYCLOHEXANE

Ludwig Brinkmann, Frankfurt am Main, and Lothar Bohn, Glashutten, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation-in-part of Ser. No. 439,878, Feb. 6, 1974, abandoned, which is a continuation-in-part of Ser. No. 366,311, June 4, 1973, abandoned, which is a continuation of Ser. No. 206,138, Dec. 8, 1971, abandoned. This application May 19, 1975, Ser. No. 578,918

Claims priority, application Germany, Dec. 10, 1970, 2060704

Int. Cl.[2] C08G *69/08, 69/14*

U.S. Cl. 260—78 A 5 Claims

1. A crystal-clear polyamide consisting essentially of the polymeric condensation product of

a. 1,3-bis-(aminomethyl)-cyclohexane or a mixture of at least 50 mol % of 1,3-bis-(aminomethyl)-cyclohexane and up to 50 mol % of 1,4-bis-(aminomethyl)-cyclohexane,

b. terephthalic acid or isophthalic acid or a mixture of terephthalic acid and isophthalic acid, and

c. at least one aliphatic amino-carboxylic acid containing from 4 to 12 carbon atoms, or at least one lactam of such an acid, the proportion of the amino-carboxylic acid or the lactam being in the range of from 5 to 60% by weight, based on the total weight of the polyamide, said polyamide having a reduced specific viscosity of 1.0 to 2.5 dl/g measured at 25° C. in a solution of one gram of polyamide in 100 ml. of a 60:40 weight ratio mixture of phenol and tetrachloroethane.

4,071,507

PREPARATION OF LACTONE POLYESTERS

Löwhardt A. A. Schoen, Geleen, Netherlands, assignor to Stamicarbon, N.V., Geleen, Netherlands

Continuation of Ser. No. 109,570, Jan. 25, 1971, abandoned. This application Apr. 6, 1973, Ser. No. 348,532

Claims priority, application Netherlands, Jan. 29, 1970, 7001237

Int. Cl.[2] C08G *63/10*

U.S. Cl. 260—78.3 R 15 Claims

1. A process for preparing polymeric lactones free of terminal reactive hydrogen substituents comprising polymerizing a polymerizable lactone with an initiator and in the presence of a catalyst, said initiator selected from the group consisting of ethyl acetate, propyl acetate, butyl acetate, 2-ethyl-hexyl acetate, ethyl benzoate, ethylene glycol diacetate, ethylene glycol dipropionate, ethylene glycol dibutyrate, ethylene glycol dibenzoate, diethylene glycol diacetate, diethylene glycol diproprionate, diethylene glycol dibutyrate, diethylene glycol dibenzoate, dimethyl terephthalate, di-(2-ethyl-hexyl)-adipate, diethyl adipate, dipropyl adipate, dibutyl adipate, dibenzyl adipate, triethylene glycol diacetate, triethylene glycol dipropionate, triethylene glycol dibutyrate and triethylene glycol dibenzoate.

4,071,508

ANIONIC HYDROGELS BASED ON HYDROXYALKYL ACRYLATES AND METHACRYLATES

Robert Steckler, San Diego, Calif., assignor to Plastomedical Sciences, Inc., Briarcliff Manor, N.Y.

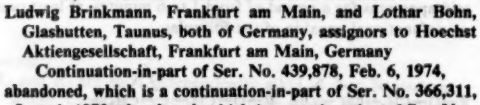
Filed Feb. 11, 1975, Ser. No. 549,098

Int. Cl.[2] C08F *220/20*

U.S. Cl. 260—79.3 MU 6 Claims

1. The anionic, polymeric hydrogel produced by simultaneous polymerization and cross-linking in the presence of a free radical polymerization catalyst in an amount of from about 0.05 to about 4 weight percent, based on the total weight of monomers, and at a temperature of from about 20° C. to about 125° C., of a mixture consisting essentially of the following monomers:

A. About 40 to about 95 weight percent, based on the total weight of monomers of an acrylic monomer selected from the group consisting of glyceryl monoacrylates and monomethacrylates and acrylic monomers having the formula:

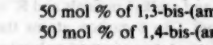


wherein:

R and R′ each represents hydrogen or lower alkyl of 1 to about 6 carbon atoms;

N represents an interger of from 1 to about 50;

B. About 50 to about 0.05 weight percent, based on the total weight of monomers, of a monoethylenically unsaturated anionic monomer, capable of copolymerizing with (A), and which contains in its molecular structure a sulfonic acid group and is selected from the group consisting of acrylamido aryl sulfonic acids, acrylamido alkyl sulfonic acids, glycidyl acrylate sulfonic acid, glycidyl methacrylate sulfonic acid, and esters of α-methylene carboxylic acids with hydroxysulfonic acids which esters have the formula:



wherein

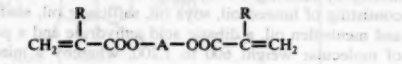
R″ represents a member of the group consisting of vinyl and α substituted vinyl,

Q represents a divalent hydrocarbon radical having its valence bonds on different carbon atoms, and

M is a cation, selected from the group consisting of hydro-

gen, ammonium, amino, alkali metal and alkaline earth metal;

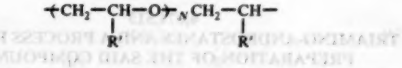
c. about 0.2 to about 12 weight percent, based on the total weight of monomers, of a polymerizable cross-linking agent, capable of copolymerizing with (a) and (b) and having the formula:



wherein

R represents a member of the group consisting of hydrogen and alkyl of from 1 to about 4 carbon atoms;

A represents alkylene of from 2 to about 10 carbon atoms or a polyglycol ether group of the formula:



in which;

R' represents a member of the group consisting hydrogen and alkyl of 1 to 2 carbon atoms;

N represents an integer of from 1 to about 20;

d. from 0 to about 50 weight percent, based on the total weight of monomers, of other monoethylenically unsaturated monomers capable of copolymerizing with (A), (B) and (C) and selected from the group consisting of: Acrylamides, Methacrylamides, acrylonitrile, alkyl acrylates, alkyl methacrylates, N-vinyl lactams, N-vinyl succinimide, N-vinyl diglycoylimide, N-vinyl glutarimide, N-vinyl-3-morpholinone, N-vinyl-5-methyl-3-morpholinone and N-vinyl imidazole; Provided that (A) ≧ (D) and (A) + (D) = about 40 to about 95 weight percent; and when an N-vinyl lactam, N-vinyl succinimide, N-vinyl diglycoylimide, N-vinyl glutarimide, N-vinyl-3-morpholinone, N-vinyl-5-methyl-3-morpholinone or N-vinyl imidazole is used it is present in an amount of less than 20 weight percent.

4,071,509

ARYLENE SULFIDE POLYMER PURIFICATION

James T. Edmonds, Jr., Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 13, 1976, Ser. No. 714,160
Int. Cl.[2] C08F *28/00*
U.S. Cl. 260—79 **10 Claims**

1. A process for the reduction of ash-forming impurities contained in arylene sulfide polymers without extensive degradation of the polymer which comprises:

a. forming a mixture comprising an arylene sulfide polymer containing at least 0.10 weight percent ash-forming impurities or materials, an organic amide, and at least one alkali metal salt selected from the group consisting of alkali metal carboxylates, alkali metal carbonates, and lithium halides selected from the group consisting of lithium chloride, lithium bromide, and lithium iodide, the amount of alkali metal salt present being sufficient to inhibit degradation of the polymer or to increase the molecular weight of the polymer, and

b. heating said mixture formed in (a) at an elevated temperature and for a period of time sufficient to produce an arylene sulfide polymer of appreciably reduced ash content without extensive degradation of said polymer.

4,071,510

PEPTIDES HAVING A HIGH ADRENOCORTICOTROPIC EFFECT AND A METHOD OF PRODUCING THE SAME

Lars Ake Ingemar Carlsson, and Jan Louis Mulder, both of Ferring AB, Fack, S-200 60 Malmo 30, Sweden

Continuation of Ser. No. 533,403, Dec. 16, 1974, abandoned. This application May 4, 1976, Ser. No. 683,144
Int. Cl.[2] C07C *103/52*; A61K *37/00*
U.S. Cl. 260—112.5 R **2 Claims**

1. Peptides having the general formula X—Glu—His—Phe—Arg—Trp—Gly—Lys—Pro—Val—Gly—Lys—Lys—$(Y)_n$—NH_2 wherein X represents ethyloxy carbonyl, benzyloxy carbonyl or D—Ser—Met, and Y represents a residue of a diaminomonocarboxylic acid and n is an integer of 2-4.

4,071,511

METHOD OF REMOVING FORMYL GROUPS FROM N-FORMYL-AMINO ACID AND N-FORMYL-PEPTIDE ESTERS HAVING FREE CARBOXYL GROUPS

Tadashi Takemoto, Toyonaka; Fusayoshi Kakizaki, Kawasaki, and Yasuo Ariyoshi, Yokohama, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Aug. 10, 1976, Ser. No. 713,270
Claims priority, application Japan, Aug. 14, 1975, 50-98817
Int. Cl.[2] C07C *103/52*
U.S. Cl. 260—112.5 R **9 Claims**

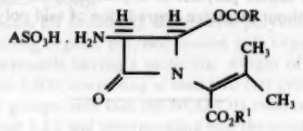
1. A method of removing the formyl group from the nitrogen atom of an N-formyl-amino acid ester or N-formyl-peptide ester having a free carboxyl group which comprises contacting said ester with a strong acid in a mixture of water and a specific organic solvent, said strong acid having a first dissociation constant of not less than 1.0×10^{-1} at 25° C, said specific organic solvent being selected from the group consisting of monohydric alkanols having 3 or 4 carbon atoms, aliphatic ketones having 3 to 5 carbon atoms and acetonitrile, and said water being used in a volume of from 5 to 30% of that of said specific organic solvent.

4,071,512
PREPARATION OF 1-OXAPENICILLINS AND INTERMEDIATES THEREFOR

Saul Wolfe, Kingston, Canada, assignor to Queen's University at Kingston, Kingston, Canada

Filed June 17, 1975, Ser. No. 587,571
Claims priority, application Canada, June 19, 1974, 202890
Int. Cl.[2] C07D *205/08, 498/04*
U.S. Cl. 260—239 A 3 Claims

1. The compound of the formula



wherein A is the residue of a sulfonic acid selected from the group consisting of benzenesulfonic acid and toluenesulfonic acid,

R is benzyl phenoxymethyl, thienylmethyl, allylthionylmethyl, or pentyl,

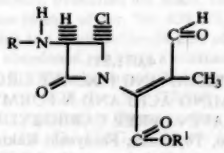
R^1 is loweralkyl of 1 to 10 carbon atoms, or benzyl.

4,071,513
SUBSTITUTED AZETIDINONE ALDEHYDES

Choung Un Kim, North Syracuse, N.Y., assignor to Bristol-Myers Company, New York, N.Y.

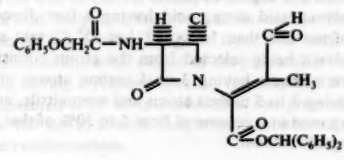
Filed Oct. 1, 1976, Ser. No. 728,697
Int. Cl.[2] C07D *205/08*
U.S. Cl. 260—239 A 2 Claims

1. A compound having the formula



wherein R is an amine protecting group and R^1 is the residue of an ester group which can be removed readily.

2. The compound having the formula



4,071,514
WATER DISPERSIBLE ALKYD PAINT COMPOSITION

Lawrence F. Ribbecke, and Chi Chen Shu, both of New York, N.Y., assignors to Sapolin Paints, Inc., Danbury, Conn.

Filed May 20, 1977, Ser. No. 798,961
Int. Cl.[2] C09D *3/64, 3/72, 5/02*
U.S. Cl. 260—22 M 8 Claims

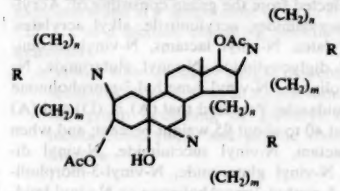
1. A method of producing miscible and water dilutable alkyd coating polymers which compises forming of alkyd moiety by reacting a conjugated oil selected from the group consisting of linseed oil, soya oil, safflower oil, sunflower oil and menhaden oil, a dibasic acid anhydride and a polyglycol of molecular weight 600 to 1,200, whereby a miscible and water dilutable alkyd coating polymer is produced, the proportions employed being from 0.2 to 0.4 equivalents of anhydride and 0.4 to 0.8 equivalents of said polyglycol per one equivalent of oil, said method including process temperatures ranging from 350° F. to 550° F.

4,071,515
TRIAMINO-ANDROSTANES AND A PROCESS FOR THE PREPARATION OF THE SAID COMPOUNDS

Zoltan Tuba; Maria Marsai; Katalin Biro; Laszlo Szporny; Egon Karpati, and Szabolcs Szeberenyi, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

Filed July 28, 1976, Ser. No. 709,323
Claims priority, application Hungary, Aug. 1, 1975, OE 574
Int. Cl.[2] C07J *17/00*
U.S. Cl. 260—239.5 22 Claims

1. A process for the preparation of new triaminoandrostanes or the acid additional salts thereof of the formula



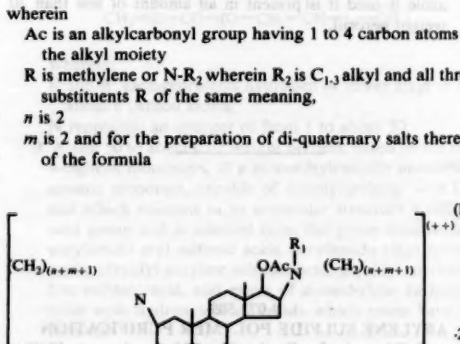
wherein

Ac is an alkylcarbonyl group having 1 to 4 carbon atoms in the alkyl moiety

R is methylene or N-R_2 wherein R_2 is C_{1-3} alkyl and all three substituents R of the same meaning,

n is 2

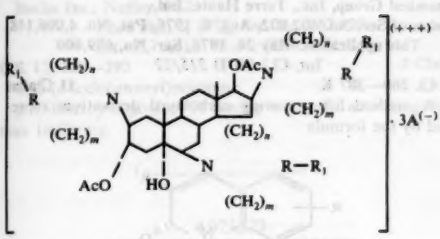
m is 2 and for the preparation of di-quaternary salts thereof of the formula



(Ia)

·2A

and for the preparation of tri-quaternary salts thereof of the formula



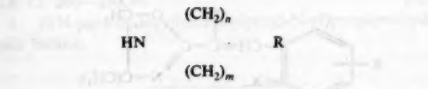
(Ib)

wherein

Ac, R, *n* and *m* are defined above,

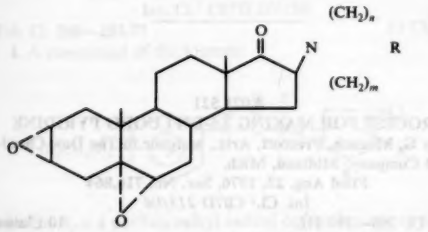
R_1 is alkyl having 1 to 5 carbon atoms and

A is a halogen atom, which comprises reacting an epoxy-androstane with a compound of the formula



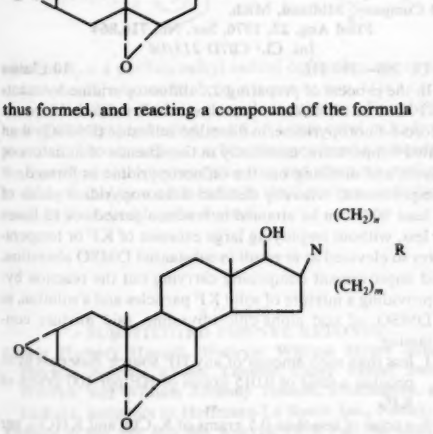
(V)

wherein R, *n*, and *m* are as defined above and reducing the compound of the formula



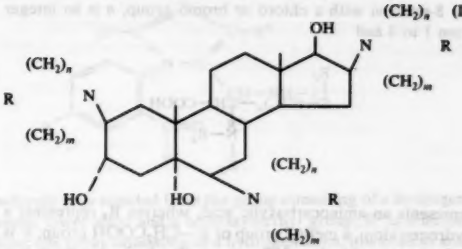
(IV)

thus formed, and reacting a compound of the formula



(III)

thus obtained again with a compound of the formula V — wherein R, *n* and *m* are defined above — with the restriction that R in the latter compound of the formula V is the same as in the first step — and acylating the compound of the formula



(II)

wherein the substituents are as defined above — with a C_{1-5} aliphatic carboxylic acid, carboxylic acid halogenide or carboxylic acid anhydride and converting the obtained compound of the formula I, if desired, into acid addition salts or quaternary salts of the formulae I*a* or I*b*.

4,071,516

4-(ACYLOXYPHENYL)-QUINAZOLIN-2(1H)-ONES

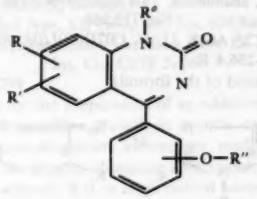
Hans J. Schwarz, Parsippany, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed Aug. 20, 1976, Ser. No. 716,138

Int. Cl.[2] **C07D** *239/82, 295/06, 295/10;* **A61K** *31/505*

U.S. Cl. 260—251 QB **22 Claims**

1. A compound of the formula



wherein

R^e is alkyl of 1 to 6 carbon atoms,

R is hydrogen, fluoro, chloro, bromo, alkyl of 1 to 4 carbon atoms, nitro or —COOR‴,

R′ is hydrogen, fluoro, chloro, bromo or alkyl of 1 to 4 carbon atoms,

R″ is a carboxylic acid acyl group hydrolyzable in blood by esterases therein, and

R‴ is hydrogen, alkyl of 1 to 4 carbon atoms or a pharmaceutically acceptable cation, with the proviso that R′ is hydrogen or halo when R is —COOR‴.

4,071,517

SOLUBLE SALTS CONTAINING SULPHUR

Claude Dufour, 4, Rond-Point Saint-James, 92200 Neuilly, France

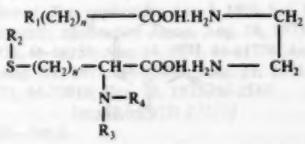
Filed Sept. 10, 1975, Ser. No. 611,988

Claims priority, application France, Sept. 10, 1974, 74 30693

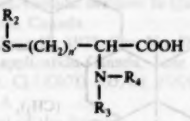
Int. Cl.[2] **C07D** *473/08*

U.S. Cl. 260—253 **15 Claims**

1. A double salt of ethylenediamine having the general formula:



wherein R_1 is a theophylyl or a theophylyl group substituted in the 8-position with a chloro or bromo group, n is an integer from 1 to 4 and



represents an aminocarboxylic acid, wherein R_2 represents a hydrogen atom, a methyl group or a $—CH_2COOH$ group; n' is an integer equal to 1 or 2; R_3 represents a hydrogen atom or a $—COCH_3$ group; R_4 represents a hydrogen atom and when sulphur and nitrogen are in a heteromonocyclic ring, n' is 1, and R_2 and R_4 represent a methylene group.

4,071,518

DI-AND TRI-SUBSTITUTED 1,2,4-TRIAZOLES

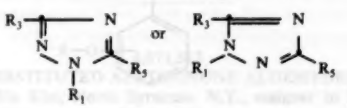
John J. Balcwin, Lansdale, and Frederick C. Novello, Berwyn, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 529,151, Dec. 3, 1974, Pat. No. 4,011,218, which is a continuation of Ser. No. 269,684, July 7, 1972, abandoned, which is a continuation-in-part of Ser. No. 75,785, Sept. 25, 1970, abandoned. This application Sept. 13, 1976, Ser. No. 722,968

Int. Cl.² A61K *31/41;* **C07D** *401/04, 401/14*

U.S. Cl. 260—256.4 R **7 Claims**

1. A compound of the formula



and the amine oxides and non-toxic salts thereof, wherein R_1 is hydrogen, lower alkyl, lower alkanoyl, benzyl, menaphthyl carbamoyl, lower alkylcarbamoyl or di-lower alkylcarbamoyl;

R_3 is pyrimidinyl; and

R_5 is pyridyl or pyrimidinyl.

4,071,519

1-CARBAMOYL-5-FLUOROURACIL DERIVATIVES

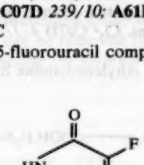
Shoichiro Ozaki, Kamakura, and Haruki Mori, Yokohama, both of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Nov. 5, 1975, Ser. No. 628,974

Int. Cl.² C07D *239/10;* **A61K** *31/505*

U.S. Cl. 260—256.4 C **7 Claims**

1. A 1-carbamoyl-5-fluorouracil compound having the formula



wherein R represents C_{3-8} alkyl.

4,071,520

METHOD FOR PREPARING CARBOSTYRIL DERIVATIVES

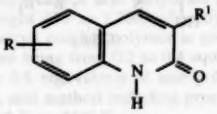
Herbert Louis Wehrmeister, Terre Haute, Ind., assignor to IMC Chemical Group, Inc., Terre Haute, Ind.

Division of Ser. No. 602,602, Aug. 6, 1975, Pat. No. 4,006,148. This application May 24, 1976, Ser. No. 689,400

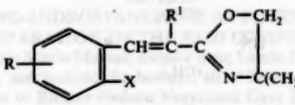
Int. Cl.² C07D *215/22*

U.S. Cl. 260—287 K **11 Claims**

1. A method for preparing carbostyril derivatives represented by the formula:



where R is 5 or 7-chloro, or 7-dimethylamino and R^1 is hydrogen, methyl, phenyl, p-methoxyphenyl, acetamido or 2,4-dichlorophenoxy with the proviso that when R is 7-chloro, R^1 cannot be hydrogen comprising the step of heating at 200°–220° C a phenylethenyl oxazoline represented by the formula



wherein X is a chlorine or bromine atom and R and R^1 have the same meanings defined above until said carbostyril derivative is formed.

4,071,521

PROCESS FOR MAKING 2,6-DIFLUORO PYRIDINE

Terry G. Muench, Prescott, Ariz., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 23, 1976, Ser. No. 716,864

Int. Cl.² C07D *213/04*

U.S. Cl. 260—290 HL **10 Claims**

1. In the process of preparing 2,6-difluoropyridine by reacting KF with an alpha-chloropyridine which is 2,6-dichloro- or 2-chloro-6-fluoropyridine, in dimethyl sulfoxide (DMSO) at an elevated temperature, essentially in the absence of initiators or catalysts, and distilling out the difluoropyridine as formed, the improvement whereby distilled difluoropyridine yields of at least 90% can be attained in reaction periods of 15 hours or less, without employing large excesses of KF or temperatures so elevated as to result in substantial DMSO alteration, said improvement comprising carrying out the reaction by:

a. providing a mixture of solid KF particles and a solution, in DMSO, of said alpha-chloropyridine, said mixture containing

1. less than such amount of any HF source materials as to provide a total of 0.015 grams of HF per 100 grams of KF,
2. a total of less than 0.5 grams of K_2CO_3 and $KHCO_3$ per 100 grams of KF,
3. less than 0.5 grams of water per 100 grams of DMSO; and

b. intensely stirring said mixture and maintaining the temperature thereof within the range of from about 175° to about 192°.

4,071,522

TRITIATED O-BENZOYLECGONINE

James Gordon Christenson, North Caldwell, and Richard R. Muccino, Verona, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jan. 6, 1977, Ser. No. 757,420
Int. Cl.[2] A61K *43/00*; C07D *471/04*
U.S. Cl. 260—292 3 Claims

1. O-(o-iodobenzoyl)ecgonine

2. O-benzoylecgonine-^{3}H having a specific activity greater than 1mCi/mg.

4,071,523

DETERGENT COMPOSITION

William Price Evans, Wirral, and Appayya Raghunath Naik, Birkenhead, both of England, assignors to Lever Brothers Company, New York, N.Y.

Division of Ser. No. 637,249, Dec. 3, 1975, Pat. No. 4,020,100, which is a continuation of Ser. No. 396,933, Sept. 13, 1973, abandoned. This application Dec. 27, 1976, Ser. No. 754,724
Claims priority, application United Kingdom, Sept. 19, 1972, 43274/72
Int. Cl.[2] C07D *211/34*
U.S. Cl. 260—293.76 1 Claim

1. β(N-para-dodecylbenzyl-piperid-N-yl)propionohydroxamic betaine.

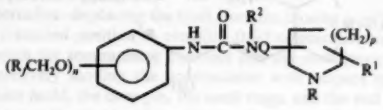
4,071,524

DERIVATIVES OF UREA

Elden H. Banitt, Woodbury, Minn., assignor to Riker Laboratories, Inc., Northridge, Calif.

Filed Nov. 8, 1976, Ser. No. 739,612
Int. Cl.[2] C07D *211/56*
U.S. Cl. 260—293.77 12 Claims

1. A compound of the formula:



wherein R_f is a perfluoroalkyl radical containing one to three carbon atoms, n is one to three, p is one or two, Q is a carbon-nitrogen bond, methylene or methylmethylene, R and R^1 are hydrogen, methyl or ethyl, and R^2 is lower alkyl or hydrogen, provided that when Q is a carbon-nitrogen bond it is bonded to the 3 position of the heterocyclic ring and when it is methylene or methylmethylene it is bonded to the 2 position, and pharmaceutically acceptable salts thereof.

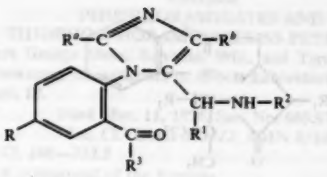
4,071,525

SUBSTITUTED PHENYL KETONES

Cedric Herbert Hassall, Welwyn; William Henry Johnson, Hitchin; Antonin Krohn, London; Carey Ernest Smithen, Welwyn, and William Anthony Thomas, Huntingdon, all of England, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 605,580, Aug. 18, 1975, Pat. No. 4,007,219.
This application Nov. 11, 1976, Ser. No. 740,917
Claims priority, application United Kingdom, Aug. 20, 1974, 36567/74; May 21, 1975, 21821/75; Aug. 11, 1975, 36567/75
Int. Cl.[2] C07D *233/64*
U.S. Cl. 260—295 AM 2 Claims

1. A compound of the general formula



wherein R^a is selected from the group consisting of a hydrogen atom, lower alkyl and a hydroxymethyl group; R^b is selected from the group consisting of a hydrogen atom, lower alkyl and a hydroxymethyl group; R is selected from the group consisting of a halogen atom, nitro and a trifluoromethyl group; R^1 is a hydrogen atom or a lower alkyl group; R^2 is an acyl group derived from a naturally occuring amino acid and R^3 is a 2-pyridyl group or acid addition salts thereof.

4,071,526

METHOD FOR THE PREPARATION OF ADDITIVES IN ORGANO-ALUMINUM ELECTROLYTE MEDIA

Richard Dotzer, Nurnberg; Hans-Georg Hauschildt, Erlangen, both of Germany; Enno Todt, deceased, late of Erlangen, Germany; by Susanne Todt, heir, Erlangen, Germany; by Ruth Katharina Todt, heir, Erlangen, Germany, and by Ernst Josef Todt, heir, Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Nov. 12, 1975, Ser. No. 630,949
Claims priority, application Germany, Nov. 13, 1974, 2453829
Int. Cl.[2] C07F *5/06*
U.S. Cl. 260—299 9 Claims

1. A method for the preparation of an additive for influencing the electrocrystalline growth in aprotic oxygen — and water-free organo-aluminum electrolyte media comprising adding at least one organo-aluminum compound of the general formula AlR_3, wherein R is an alkyl radical having from 1 to 4 carbon atoms to a sulfonamide compound selected from the group consisting of o-benzoic acid sulfonimide, N-benzoylbenzene sulfonimide, di-benzene sulfonimide, benzene-o-disulfonimide and benzene sulfonic acid amide in the presence of inert organic solvent at a temperature not exceeding 100° C to form a reaction product of said organo-aluminum compound and said sulfonamide compound dissolved in said inert organic solvent, said reaction product containing an aromatic ring substituent and an alkyl group bound to aluminum.

9. A brightener additive for the direct electrodeposition of bright or mirror-like aluminum on metals and conductive materials comprising the reaction product of claim 1.

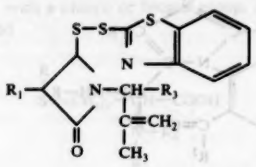
4,071,527

CERTAIN BENZOTHIAZOLE COMPOUNDS

Takashi Kamiya, Suita; Tsutomu Toyonaka Teraji; Masashi Hashimoto, Toyonaka; Teruo Kyoto Oku; Osamu Nakaguti, Osaka; Yoshihisa Saito, Takarazuka, and Hitoshi Nakamura, Toyonaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaki, Japan

Division of Ser. No. 430,688, Jan. 4, 1974, Pat. No. 3,993,646, which is a continuation-in-part of Ser. No. 266,470, June 26, 1972, abandoned. This application Aug. 5, 1976, Ser. No. 711,980
Claims priority, application Japan, Aug. 18, 1971, 46-62687; June 24, 1971, 46-46158; Aug. 14, 1971, 46-61776; Aug. 14, 1971, 46-61777; Aug. 21, 1971, 46-63885; Aug. 21, 1971, 46-63886; Sept. 9, 1971, 46-70018; Dec. 23, 1971, 46-2516
Int. Cl.[2] C07D *277/78*
U.S. Cl. 260—306.5 18 Claims

1. An oxoazetidine derivative compound of the formula:



wherein R_1 represents cyano(lower)alkanoylamino, phenyl(lower)alkanoylamino, phenoxy(lower)alkanoylamino, phenyl(lower)alkanoylamino substituted by lower alkoxycarbonylamino, phenyl(lower)alkanoylamino substituted by trihalo(lower)alkoxycarbonylamino, hydroxyphenyl(lower)alkanoylamino substituted by lower alkoxycarbonylamino, thienyl(lower)alkanoylamino, sydononyl(lower)alkanoylamino or lower alkoxycarbonyl(lower)alkylideneamino, R_3 represents carboxy, lower alkyl ester, trihalo(lower)alkyl ester, phenyl(lower)alkyl ester wherein phenyl is substituted by hydroxy and two lower alkyl groups or ester with acetoxime and wherein "lower" refers to from 1 to 5 carbon atoms.

4,071,528

CERTAIN THIAZOLIDINE AND TETRAHYDROTHIAZINE COMPOUNDS

Sally Elizabeth Dalton, Brentwood; William George Gingell, Stondon Massey, near Brentwood; David Conwil Jenkins, Barkingside; Leslie George King, London; Glyn Evan Lee, Thorpe Bay, and Garth Molesdale Thompson, Brentwood, all of England, assignors to May & Baker Limited, England

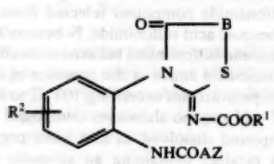
Filed Oct. 27, 1976, Ser. No. 736,170

Claims priority, application United Kingdom, Oct. 29, 1975, 44717/75

Int. Cl.² C07D *277/54, 279/06*

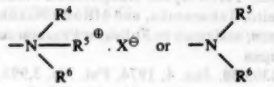
U.S. Cl. 260—306.7 T **17 Claims**

1. A benzene derivative of the formula:



I

wherein R^1 is alkyl of 1 through 4 carbon atoms, R^2 is $—SR^3$, $—SOR^3$, $—SO_2R^3$ or $—OR^3$, where R^3 is alkyl of 1 through 6 carbon atoms, allyl, phenyl, benzyl, cyclopentyl, or cyclohexylmethyl, the position of R^2 on the benzene ring being either para to the group —NHCOAZ or para to the heterocyclo group shown in the formula, A is a bivalent straight-chain aliphatic hydrocarbon radical of 1 through 4 carbon atoms or a said hydrocarbon radical substituted by at least one methyl group, Z is a group of the formula:



II III

wherein R^4 is hydrogen or alkyl or 1 through 4 carbon atoms, R^5 and R^6 are each methyl or ethyl, and X^- represents a pharmaceutically acceptable or agriculturally acceptable anion, and B represents a bivalent methylene or ethylene group, or a bivalent methylene or ethylene group substituted by at least one methyl group.

4,071,529

DERIVATIVES OF 6-AMINOPENICILLANIC ACID

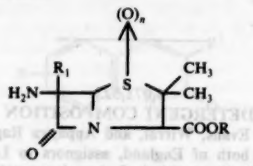
Burton G. Christensen, Scotch Plains, and Lovji D. Cama, Edison, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 149,349, June 2, 1971, abandoned. This application Aug. 5, 1974, Ser. No. 495,010

Int. Cl.² C07D *499/42*

U.S. Cl. 260—306.7 C **4 Claims**

1. A compound having the formula:



where *n* is the integer 0 or 1; R_1 is lower alkylthio; and R is selected from the group consisting of hydrogen, lower alkyl, trimethylsilyl, benzyl, methoxybenzyl, and trichloroethyl; and pharmaceutical acceptable salts thereof.

4,071,530

PYRROLIDONES AND PROCESS FOR PREPARING THEM

Klaus Kühlein, Kelkheim, Taunus; Dieter-Bernd Reuschling, Butzbach; Milos Babej, Frankfurt am Main; Wilhelm Bartmann, Neuenhain, Taunus, and Gerhard Beck, Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

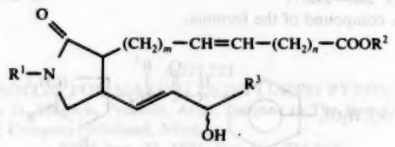
Filed Nov. 4, 1975, Ser. No. 628,479

Claims priority, application Germany, Nov. 6, 1974, 2452536; June 24, 1975, 2528036

Int. Cl.² C07D *207/26*

U.S. Cl. 260—326.45 **4 Claims**

1. A pyrrolidone of the formula



the corresponding free acid, or a physiologically compatible metal or amine salt thereof, wherein R^1 is straight-chain or branched alkyl having 1 to 6 carbon atoms; R^2 is straight-chain or branched alkyl having 1 to 4 carbon atoms; R^3 is straight-chain or branched alkyl having 1 to 10 carbon atoms; *m* is 1 or 2; *n* is 2 or 3; and wherein the side chains in the 3- and 4-positions in the pyrrolidone ring are in transposition to each other.

4,071,531

OXATHIINO- AND DITHIINO-AMINOACETIC ACIDS

Christian Berger, Le Plessis Robinson; Daniel Farge, Thiais; Georges Gros, Bourg-la-Reine; Mayer Naoum Messer, Bievres, and Claude Moutonnier, Le Plessis-Robinson, all of France, assignors to Rhone-Poulenc Industries, Paris, France

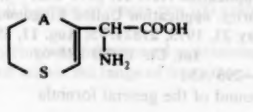
Filed Sept. 26, 1975, Ser. No. 616,991

Claims priority, application France, Sept. 27, 1974, 74 32702

Int. Cl.² C07D *501/60, 327/06, 339/08;* A61K *31/54*

U.S. Cl. 260—327 P **5 Claims**

1. An oxathiino- or dithiino-aminoacetic acid of formula:



(I)

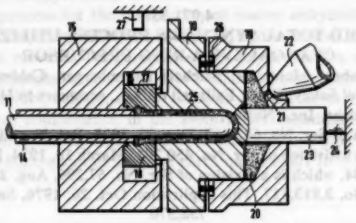
in which A is oxygen or sulphur, in racemic or optically active form, as the free acid or as a derivative thereof selected from an acid addition salt, an acid halide, and the anhydride.

4,071,532

METHOD FOR MANUFACTURING PLASTICS BLANKS

Peter Rose, Henstedt-Ulzburg, Germany, assignor to Heidenreich & Harbeck Zweigniederlassung der Gildemeister AG, Hamburg, Germany

Division of Ser. No. 515,831, Oct. 18, 1974, Pat. No. 3,947,203. This application Nov. 14, 1975, Ser. No. 631,985
Claims priority, application Germany, Dec. 21, 1973, 2364004
Int. Cl.² B29F *1/06, 1/14*
U.S. Cl. 264—328 **1 Claim**



1. In a method of forming plastic blanks, the steps of:

1. accumulating flowable plastic material in a chamber defined by a fixed accumulator and an end portion of an outer movable mold, said outer mold including a cavity in which a movable cylindrical core pin is concentrically positioned to define a mold cavity for forming plastic blanks, and said outer mold including a passageway extending from the end thereof to said cavity;
2. during Step (1), (A) closing the mold passageway with a retractable shaft which extends through the accumulator chamber and (B) axially confining a pair of radially movable neck rings between the outer mold and an axially displaceable end plate;
3. thereafter, displacing the shaft from the closing position to a retracted position to establish fluid communication between the accumulator chamber and the mold cavity;
4. relatively moving the accumulator with respect to the outer mold, the core pin, the neck rings, and the end plate to move the mold end portion into the accumulator chamber to force plastic material through the passageway into the mold cavity;
5. during Step (4), (A) relatively moving the retractable shaft and the mold passageway toward each other, (B) retracting a tubular sleeve from within the mold cavity against a biasing force in response to the flow of plastic material into the cavity, (C) withdrawing the sleeve through the neck rings to expose a neck ring cavity, and (D) axially confining the neck rings between the outer mold and the end plate;
6. terminating the relative movement of the accumulator and the outer mold upon re-engagement of the mold passageway and the retractable shaft;
7. axially displacing the end plate, neck rings, core and sleeve away from the accumulator to telescopically withdraw the core with the plastic material thereon from the mold cavity;
8. during the performance of Step (7), maintaining the end plate, neck rings, sleeve and core pin in a fixed relationship with respect to each other;
9. radially displacing the neck rings away from the core pin to release the molded neck of the plastic material; and
10. displacing the sleeve relative to the core toward the outer mold to eject the plastic material from the core as a molded article.

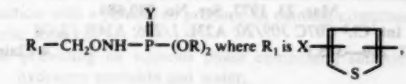
4,071,533

PHOSPHORAMIDATES AND THIOPHOSPHORAMIDATES AS PESTICIDES

Robert George Stein, Kenosha, Wis., and Terry Lee Couch, Waukegan, Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Mar. 11, 1976, Ser. No. 665,975
Int. Cl.² C07D *333/12*; A01N *9/36*
U.S. Cl. 260—332.5 **5 Claims**

1. A compound of the formula



and X is hydrogen, halo, alkyl, cyano or nitro, Y is oxygen or sulfur and R is lower alkyl.

4,071,534

PROCESS FOR PRODUCING L-ASCORBIC ACID-2-SULFATE

Eiichi Hayashi, Shizuoka; Kiyoshi Takita, Shimizu; Hironari Sugiyama, Shimizu, and Yukio Nezu, Shimizu, all of Japan, assignors to Kumiai Chemical Industry Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 521,767, Nov. 7, 1974, abandoned. This application Aug. 3, 1976, Ser. No. 711,410
Claims priority, application Japan, Nov. 7, 1973, 48-124395; Nov. 8, 1973, 48-124951; United Kingdom, Oct. 29, 1974, 46760/74; Aug. 21, 1975, 34845/75; Germany, Nov. 6, 1974, 2452719; France, Nov. 6, 1974, 74 36797; Canada, Nov. 4, 1974, 212951; Switzerland, Nov. 6, 1974, 14919/74; U.S.S.R., Nov. 6, 1974, 2075017/234
Int. Cl.² C07D *307/62*
U.S. Cl. 260—343.7 **6 Claims**

1. A process for producing a mono- or di-alkali metal salt or alkaline earth metal salt of L-ascorbic acid-2-sulfate which comprises:

A. reacting L-ascorbic acid in which the 5 and 6 positions are protected by a ketone or aldehyde, with dimethyl formamide-sulfur trioxide complex produced by mixing dimethyl formamide and chlorosulfonic acid in an inert solvent and thereafter adding a dehydrohalogenating agent of a tertiary amine, so as to produce a sulfate, and
B. neutralizing the product with an alkali metal hydroxide or an alkaline earth metal hydroxide, and
C. removing said protecting aldehyde or ketone at the 5- and 6-positions.

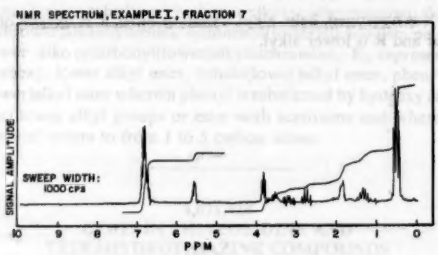
4,071,535
2-ALKYL-4-PHENYL-DIHYDROPYRANS AND PROCESSES FOR AUGMENTING THE ORGANOLEPTIC PROPERTIES OF FOODSTUFFS AND TOBACCO USING ONE OR MORE OF SAID PYRANS

Joaquin Francisco Vinals, Red Bank, N.J.; Jacob Kiwala, Brooklyn, N.Y.; Denis E. Hruza, Sr., Brick Town, N.J.; John B. Hall, Rumson, N.J., and Manfred Hugo Vock, Locust, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

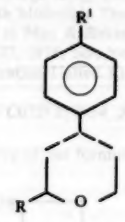
Division of Ser. No. 676,389, April 12, 1976. This application Mar. 23, 1977, Ser. No. 780,684

Int. Cl.[2] C07C *309/20;* A23L *1/226;* A24B *15/04*

U.S. Cl. 260—345.1 4 Claims



1. A compound having the generic structure:



wherein one of the dashed lines is a carbon-carbon double bond and the other of the dashed lines is a carbon-carbon single bond and R is one of C_2–C_4 alkyl and R^1 is one of C_1–C_3 alkyl.

4,071,536
ANTIBIOTICS

Kevin David Barrow, Kensington, Australia, and Graham Mellows, London, England, assignors to Beecham Group Limited, Great Britain

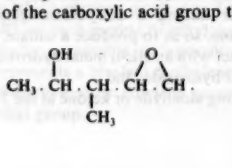
Continuation-in-part of Ser. No. 463,197, April 22, 1974, abandoned, which is a continuation-in-part of Ser. No. 261,042, June 8, 1972, abandoned. This application May 7, 1976, Ser. No. 684,077

Claims priority, application United Kingdom, June 12, 1971, 27653/71

Int. Cl.[2] C07D *309/10*

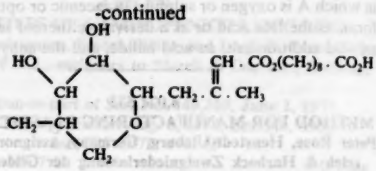
U.S. Cl. 260—345.8 R 4 Claims

1. A compound which is the free acid form of pseudomonic acid having the formula (I) or an alkali metal salt or methyl ester of the carboxylic acid group thereof :



(I)

-continued



, the double bond being in the trans-configuration.

4,071,537
STEROID TOTAL SYNTHESIS PROCESS UTILIZING A CYANOALKYL A-RING PRECURSOR

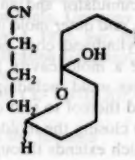
Noal Cohen, Montclair; Michael Rosenberger, Caldwell, and Gabriel Saucy, Essex Falls, all of N.J., assignors to Hoffman-La Roche, Inc., Nutley, N.J.

Division of Ser. No. 642,817, Dec. 22, 1975, Pat. No. 4,045,452, which is a division of Ser. No. 450,701, March 13, 1974, Pat. No. 3,991,084, which is a division of Ser. No. 67,296, Aug. 26, 1970, Pat. No. 3,813,417. This application Oct. 26, 1976, Ser. No. 735,570

Int. Cl.[2] C07D *309/22*

U.S. Cl. 260—345.9 S 5 Claims

1. A compound of the formula



where R_{16} is di(lower) alkylamino mineral, non-optically active hydrocarbyl monocarboxylic or non-optically active hydrocarbyl dicarboxylic acid addition salt or desoxyephedrine mineral, non-optically active hydrocarbyl monocarboxylic or non-optically active hydrocarbyl dicarboxylic acid addition salt.

4,071,538
PYRAN ALDEHYDES

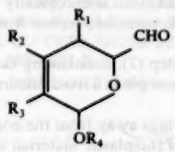
Gary Lee Olson, Westfield, NJ, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 618,708, Oct. 1, 1975, Pat. No. 3,997,529, which is a continuation-in-part of Ser. No. 594,377, July 9, 1975, abandoned. This application Oct. 8, 1976, Ser. No. 731,056

Int. Cl.[2] C07D *309/30*

U.S. Cl. 260—345.9 R 3 Claims

1. A compound of the formula:



IIa

wherein R_1, R_2 and R_3 are hydrogen or lower alkyl and R_4 is lower alkyl.

4,071,539
PROCESS FOR PREPARING MALEIC ANHYDRIDE FROM C_4 HYDROCARBONS

Ralph O. Kerr, and Bruno J. Barone, both of Houston, Tex., assignors to Denka Chemical Corporation

Division of Ser. No. 473,489, March 28, 1974, Pat. No. 3,980,585. This application Mar. 17, 1976, Ser. No. 667,623

Int. Cl.[2] C07D *307/60*

U.S. Cl. 260—346.75 6 Claims

1. A process for the production of maleic anhydride comprising contacting a feed of normal C_4 hydrocarbons comprising at least 90 mol percent n-butane in vapor phase at elevated temperatures with oxygen and a catalyst complex consisting essentially of vanadium, phosphorus, copper and Ce as the active components in the atom ratios, vanadium 1: phosphorus 0.90 to 1.3:copper 0.005 to 0.3:Ce 0.005 to 0.25.

5. A process for the production of maleic anhydride comprising contacting a feed of normal C_4 hydrocarbons in vapor phase at elevated temperatures with oxygen and a catalyst complex consisting essentially of vanadium, phosphorus, copper, tellurium, cerium, and an alkali or alkaline earth metal, as the active components, in the atom ratios vanadium 1:phosphorus 0.90 to 1.3:copper 0.005 to 0.3:tellurium plus cerium 0.005 to 0.25: alkali or alkaline earth metal 0.001 to 0.1.

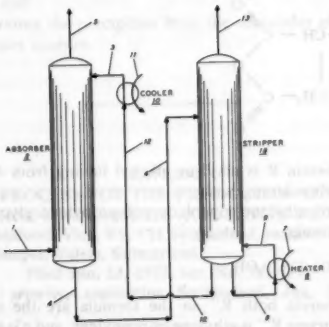
4,071,540
ANHYDRIDE SEPARATION PROCESS

David M. Marquis, Lafayette, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 703,478, July 8, 1976, abandoned, which is a continuation of Ser. No. 550,070, Feb. 14, 1975, abandoned, which is a continuation-in-part of Ser. No. 452,488, March 18, 1976, abandoned. This application Aug. 6, 1976, Ser. No. 712,413

Int. Cl.[2] C07D *307/60, 307/89*

U.S. Cl. 260—346.76 13 Claims



1. An absorption process for separating maleic or phthalic anhydride from a gaseous mixture containing the anhydride which comprises contacting the gaseous mixture with a liquid absorbent comprising polymethylbenzophenones, at least a portion of which benzophenones contain at least 3methyl groups, at a temperature for the liquid absorbent between about 20° and 235° C and at a pressure sufficient to effect absorption of the anhydride into the absorbent.

4,071,541
EPOXIDATION

Anthony MacDonald Hildon, Tattenhall, and Peter Frederick Greenhalgh, Widnes, both of England, assignors to Interox Chemicals Limited, London, England

Filed Jan. 16, 1976, Ser. No. 649,747

Claims priority, application United Kingdom, Feb. 4, 1975, 4692/75

Int. Cl.[2] C07D *301/14*

U.S. Cl. 260—348.25 14 Claims

1. A continuous process for the epoxidation of an alkene by reaction with a peracid to produce an oxirane, comprising the cyclic steps of:

a. providing an aqueous phase comprising sulfuric acid, hydrogen peroxide and water;

b. providing an organic phase comprising a chlorinated hydrocarbon solvent and a carboxylic acid selected from the group consisting of acetic acid and propionic acid;

c. continuously contacting said aqueous and organic phases countercurrently to produce an aqueous solution comprising sulfuric acid and water and a separate organic solution comprising said chlorinated hydrocarbon solvent and a peracid selected from the group consisting of peracetic acid and perpropionic acid, said peracid being produced by reaction of said carboxylic acid and said hydrogen peroxide;

d. recycling said aqueous solution to said aqueous phase of step (a);

e. contacting said organic solution and an alkene to react the alkene and the peracid of said organic solution to produce a product mixture comprising oxirane, carboxylic acid and chlorinated hydrocarbon;

f. effecting distillation of said product mixture to produce a product phase comprising the oxirane and a recycle phase comprising carboxylic acid and chlorinated hydrocarbon; and

g. recycling said recycle phase to said organic phase of step (b).

4,071,542
SYNTHESIS OF HYDROXYCYCLOPENTEN-1-ONES

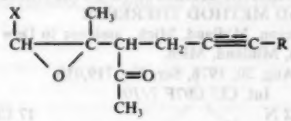
George Buchi, Cambridge, Mass., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 680,949, April 28, 1976, Pat. No. 4,032,577, which is a division of Ser. No. 547,688, Feb. 6, 1975, Pat. No. 3,978,093, which is a division of Ser. No. 158,080, June 29, 1971, Pat. No. 3,884,979. This application Mar. 25, 1977, Ser. No. 781,099

Int. Cl.[2] C07D *303/32*

U.S. Cl. 260—348.48 2 Claims

1. The compound of the formula:



wherein R is hydrogen, lower alkyl or lower alkenyl; X is chloro; and the dotted bond can be optionally hydrogenated.

4,071,543
PROCESS FOR THE PREPARATION OF ACYLTAURIDES

Günther Boehmke, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 24, 1976, Ser. No. 717,210
Claims priority, application Germany, Aug. 26, 1975, 2537914
Int. Cl.[2] C07C 143/90; C11D 1/28
U.S. Cl. 260—401 5 Claims

1. Process for the preparation of acyltaurides of the general formula:

$$R\text{-}CO\text{-}NH\text{-}CH_2\text{-}CH_2\text{-}SO_3M$$

wherein

R is C_7-C_{21}-alkyl or -alkenyl which is unsubstituted or mono- or di-substituted with hydroxyl; and

M is an alkali metal or alkaline earth metal cation, ammonium, or mono-, di-, or tri-alkanol ammonium comprising reacting a corresponding fatty acid or mixtures thereof with an alkali metal or alkaline earth metal hydroxyethane sulfonate and urea, in a reaction medium consisting essentially of said corresponding fatty acid or mixtures thereof, said alkali metal or alkaline earth metal hydroxyethane sulfonate, and said urea.

4,071,544
PROCESS FOR THE MANUFACTURE OF CITRIC ACID ESTERS OF PARTIAL FATTY ACID GLYCERIDES

Volkbert Bade, Essen, Germany, assignor to Th. Goldschmidt AG, Essen, Germany

Filed Nov. 20, 1975, Ser. No. 633,718
Claims priority, application Germany, Nov. 27, 1974, 2455989
Int. Cl.[2] C11C 3/02
U.S. Cl. 260—410.7 4 Claims

1. In a method for the manufacture of citric acid esters from the esterification reaction of fatty acid monoglycerides and fatty acid diglycerides with citric acid at elevated temperature, the improvement which comprises carrying out the reaction in acetic acid as a solvent and removing the acetic acid during the reaction by distillation at a rate sufficient to maintain a clear reaction solution with no precipitate therein.

4,071,545
PREPARATION OF S-TRICYCLOHEXYLTIN-O,O-DIISOPROPYL DITHIOPHOSPHATE

Alexander Mihailovski, Kensington, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 619,136, Oct. 2, 1975, abandoned. This application Apr. 6, 1976, Ser. No. 674,257
Int. Cl.[2] C07F 7/22
U.S. Cl. 260—429.7 9 Claims

1. A process for the production of S-tricyclohexyltin-O,O-diisopropyl dithiophosphate comprising reacting tricyclohexyltin chloride, diisopropyl dithiophosphoric acid and a base selected from the group consisting of alkali metal hydroxides and ammonium hydroxide in a substantially two-phase system comprising an aqueous phase and an organic phase.

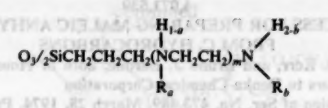
4,071,546
SILICON-CONTAINING CHELATING COMPOSITION AND METHOD THEREFOR

Edwin P. Plueddemann, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Aug. 30, 1976, Ser. No. 719,015
Int. Cl.[2] C07F 7/10
U.S. Cl. 260—448.2 N 17 Claims

1. A composition comprising a siliceous support having bonded to the surface thereof an organosiloxane consisting essentially of at least 50 mol percent of

A. siloxane units having the formula



wherein R is $-CH_2COOH$ or $-CH_2COO^-M^+$, M^+ is an alkali metal anion, m is 0 or 1, a is 0 or 1 and b is 1 or 2, the total of $(m\text{-}a) + b$ having a value of at least 2; and up to 50 mol percent of

B. siloxane units having the formula

$$O_3/_2SiZ$$

wherein Z is a monovalent hydrocarbon radical having from 1 to 6 inclusive carbon atoms, the total of (A) and (B) being 100 mol percent.

4,071,547
3-BROMO-2,2-BIS(BROMOMETHYL)PROPYL BROMOMETHANESULFONATE

Christian T. Goralski, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 4, 1976, Ser. No. 738,813
Int. Cl.[2] C07C 143/68; A61K 31/255
U.S. Cl. 260—456 R 1 Claim

1. 3-Bromo-2,2-bis(bromomethyl)propyl bromomethanesulfonate.

4,071,548
LUBRICATING OIL ADDITIVE, PROCESS FOR THE SYNTHESIS THEREOF AND LUBRICATING OIL ADDITIVE COMPOSITION

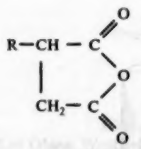
Nobukazu Okamoto, Ohimachi, Japan, assignor to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 310,095, Nov. 28, 1972, Pat. No. 3,991,098.
This application Aug. 16, 1976, Ser. No. 714,320
Claims priority, application Japan, Nov. 30, 1971, 46-96580; Nov. 30, 1971, 46-96581
Int. Cl.[2] C07F 5/04
U.S. Cl. 260—462 R 1 Claim

1. A lubricating oil additive composition comprising a reaction product obtained by

I. reacting

A. an alkyl- or alkenylsuccinic anhydride of the formula



wherein R is alkyl or alkenyl having from 40 to 200 carbon atoms, with

B. polyethylene glycol or polypropylene glycol of the formula

$$HOR'''(OR''')_pOH$$

wherein both R''' in the formula are the same and wherein R''' is ethylene or propylene, and p is an integer from 4 to 19

at a molar ratio of A:B in the range of 1:1 to 1:0.1, at a temperature in the range of 150° to 220° C, until the infrared absorptions for $\nu_{C=O}$ at 1870cm^{-1} and 1790cm^{-1} disappear, an infrared absorption for $\nu_{C=O}$ is present at 1750cm^{-1}, and an infrared absorption for ν_{OH} is present at about 3450cm^{-1}, to obtain a first intermediate product, and then

II. reacting said first intermediate product with

C. a secondary alkanolamine of the formula

$NH(R''' OH)_2$

wherein R''' is as defined above at a molar ratio of said first intermediate product:C in the range of 1:0.3 to 1:1, under reduced pressure, at a temperature in the range of from 150° to 200° C, until infrared absorptions are present for $\nu_{C=O}$ at 1750cm^{-1} and 1650cm^{-1}, an infrared absorption is present for ν_{OH} at about 3450cm^{-1} and no turbidity is observed when the reaction mixture is dissolved in n-pentane and is cooled, and then

III. reacting the product of step II with boric acid or boric acid anhydride at a molar ratio of from 0.3 to one mole of boric acid or boric acid anhydride per one mole of A, under reduced pressure, at a temperature of 100° to 200° C until the infrared absorption for ν_{OH} at about 3450cm^{-1} disappears and no turbidity or precipitate appears when the reaction mixture is dissolved in n-pentane and is cooled.

4,071,549
PROCESS FOR THE PREPARATION OF BIS-(BETA-CYANOETHYL) ALKYL PHOSPHINE FROM TRIS-CYANOETHYL PHOSPHINE

Glenn R. Wilson, Pensacola, Fla., assignor to Monsanto Company, St. Louis, Mo.

Filed Mar. 7, 1977, Ser. No. 775,027
Int. Cl.[2] C07C *120/00*
U.S. Cl. 260—465.8 R 5 Claims

1. Process for the preparation of C_1–C_6 clkyl bis-(β-cyanoethyl) phosphine from tris-cyanoethyl phosphine comprising

a. preparing a phosphonium sulfate of tris-cyanoethyl phosphine by alkylating tris-cyanoethyl phosphine with di(C_1–C_6 alkyl) sulfate in an essentially oxygen-free reaction zone;

b. dequarternizing the phosphonium sulfate of tris-cyanoethyl phosphine with methanolic potassium hydroxide in an essentially oxygen-free reaction zone to produce a first reaction mixture including C_1–C_6 alkyl bis-(β-cyanoethyl) phosphine and a precipitate being potassium methyl sulfate; and

c. separating the precipitate from the remainder of the first reaction mixture.

4,071,550
PROCESS FOR THE PRODUCTION OF AMINOCYANOACETIC ACID ETHYL ESTER

Enrico Catalucci, Visp, VS, CH Switzerland, assignor to Lonza, Ltd., Gampel, Valais, Switzerland

Filed Jan. 13, 1977, Ser. No. 759,027
Claims priority, application Switzerland, Jan. 13, 1976, 312/76
Int. Cl.[2] C07C *120/00*
U.S. Cl. 260—465.4 3 Claims

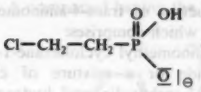
1. In the process for the production of the ethyl ester of aminocyanoacetic acid by reduction of the ethyl ester of nitrosocyanoacetic acid, the improvement characterized in that said ethyl ester of nitrosocyanoacetic acid is hydrogenated in a solvent which is selected from the group consisting of methanol, ethanol and a propanol in the presence of Raney nickel at an excess pressure with hydrogen of 1 to 10 atms. and at a temperature of 10° C. for 40 hours to 60° C. for 8 hours.

4,071,551
SALTS OF PHOSPHONIC ACIDS

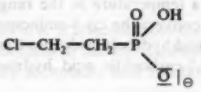
Johann Jung, Limburgerhof; Karl Kiehs, Lampertheim; Bernd Zeeh, Ludwigshafen, and Hans Theobald, Limburgerhof, all of Germany, assignors to VASE Aktiengesellschaft, Ludwigshafen, Germany

Filed Apr. 14, 1975, Ser. No. 568,147
Int. Cl.[2] C07C *87/30;* C07D *295/02;* A01N *21/02*
U.S. Cl. 260—501.15 2 Claims

1. A salt of a phosphonic acid having the formula



2. A salt of a phosphonic acid having the formula

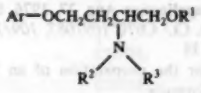


4,071,552
ARYLOXY AMINOBUTANOLS, THEIR PREPARATION AND USE THEREOF

Jean-Marie Ferland, St. Laurent; Real Laliberte, Chomedey; Wilbur Lippmann, Montreal, and Thomas A. Pugsley, Kirkland, all of Canada, assignors to Ayerst McKenna and Harrison Ltd., Montreal, Canada

Filed May 19, 1976, Ser. No. 687,852
Int. Cl.[2] C07C *91/16;* A61K *31/135;* C07C *93/18*
U.S. Cl. 260—501.17 15 Claims

1. A compound of Formula 1



in which Ar is phenyl or 1-naphthyl; R^1 is hydrogen or lower alkyl; and R^2 and R^3 are either the same or different selected from the group consisting of hydrogen or lower alkyl having 1–2 carbons; with the proviso that when Ar is 1-naphthyl then

is selected from the group consisting of amino, ethylamino and dimethylamino; and with the proviso that when Ar is phenyl then

is methylamino; and with the further proviso that when R^1 is lower alkyl then R^2 is the same lower alkyl; or a therapeutically acceptable acid addition salt thereof.

4,071,553

METHOD FOR THE PRODUCTION OF TRANS-4-AMINOMETHYL CYCLOHEXANE-1-CARBOXYLIC ACID

Masaaki Takahashi, Tokyo; Akira Iizuka, Higashimurayama, and Kiro Asano, Kukizaki, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 27, 1976, Ser. No. 690,516
Claims priority, application Japan, May 27, 1975, 50-62453
Int. Cl.² C07C *51/42, 99/12*
U.S. Cl. 260—514 J **2 Claims**

1. A method for the production of trans-4-aminomethyl cyclohexane-1-carboxylic acid, which comprises:

a. thermally melting cis-4-aminomethyl cyclohexane-1-carboxylic acid hydrochloride or a mixture of cis-4-aminomethyl cyclohexane-1-carboxylic acid hydrochloride and trans-4-aminomethyl cyclohexane-1-carboxylic acid hydrochloride without a solvent in an atmosphere of hydrogen chloride gas at a temperature in the range of from 160° C to 248° C, to convert the cis-4-aminomethyl cyclohexane-1-carboxylic acid hydrochloride into trans-4-aminomethyl cyclohexane-1-carboxylic acid hydrochloride; and

b. subsequently dehydrochlorinating the trans-4-aminomethyl cyclohexane-1-carboxylic acid hydrochloride.

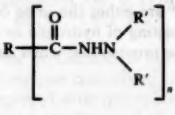
4,071,554

METHOD FOR THE PREPARATION OF N,N-DIALKYL HYDRAZIDES

Robert A. Grimm, Columbus, Ohio; Neil A. Randen, Stillwater, Minn., and Christopher L. Demas, Columbus, Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Continuation-in-part of Ser. No. 559,806, March 19, 1975, abandoned. This application Aug. 27, 1976, Ser. No. 718,223
Int. Cl.² C07C *109/087, 109/10*
U.S. Cl. 260—558 H **6 Claims**

1. A method for the preparation of an N,N-dialkyl acid hydrazide of the formula:



wherein *n* is the integer 1 or 2; R is alkylene, m-phenylene or p-phenylene when *n* is 2; R is alkyl or aryl when *n* is 1; R′ is lower alkyl; which comprises the steps:

a. reacting hydazine with a lower alkyl ester of a carboxylic acid of the formula R—[COOH]$_n$ wherein R and n have the above-defined meanings to form the corresponding unsubstituted acyl hydrazine;

b. adjusting the pH of the reaction mixture of step (a) to not in excess of 7.5, and thereupon slowly and continuously adding at least 2 moles of a C_1–C_6 aldehyde for each equivalent of acyl hydrazine formed in step (a) in the presence of hydrogen and a Group VIII metal catalyst while maintaining the reaction temperature at from about 40° to 100° C.; and

c. recovering said dialkyl acid hydrazide from the reaction mixture of step (b).

4,071,555

BENZENE-1,3,5-TRIS-ACETOXIME AND THE PROCESS FOR MAKING PHLOROGLUCINOL THEREWITH

Hans Zengel, Kleinwallstradt, and Manfred Bergfeld, Erlenbach, Main, both of Germany, assignors to Akzona Incorporated, Asheville, N.C.

Filed May 12, 1977, Ser. No. 796,109
Claims priority, application Germany, May 14, 1976, 2621431
Int. Cl.² C07C *131/00*
U.S. Cl. 260—566 A **1 Claim**

1. Benzene-1,3,5-tris-acetoxime.

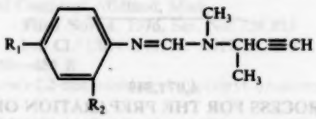
4,071,556

FORMAMIDINE INSECTICIDAL COMPOUNDS

Ferenc M. Pallos, Walnut Creek, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Mar. 11, 1974, Ser. No. 449,792
Int. Cl.² C07C *123/00*
U.S. Cl. 260—564 RF **6 Claims**

1. The compound having the formula:



wherein R_1 and R_2 are independently methyl or halogen.

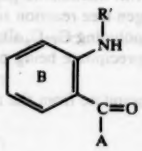
4,071,557

PREPARATION OF 2-SUBSTITUTED AMINOPHENYL KETONES

Paul G. Mattner, Brooklyn, N.Y., and Joseph A. Smith, Fanwood, N.J., assignors to Sandoz, Inc., E. Hanover, N.J.

Filed Jan. 29, 1976, Ser. No. 653,362
Int. Cl.² C07C *97/10*
U.S. Cl. 260—570 AB **23 Claims**

1. The process for producing a 2-monosubstitutedaminophenyl ketone of the formula:



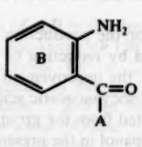
wherein

R′ is sec.-alkyl of 3 to 7 carbon atoms, cycloalkyl of 5 to 7 carbon atoms optionally monosubstituted by alkyl of 1 to 4 carbon atoms, optionally mono- or di-substituted benzyl or optionally monosubstituted furylmethyl,

Ring B is optionally mono- or di-substituted or substituted by alkylenedioxy of 1 or 2 carbon atoms, and

A is optionally mono- or di-substituted monocyclic aryl or optionally mono- or di-substituted naphthyl;

from a corresponding 2-unsubstitutedaminophenyl ketone of the formula:



wherein A and B are as above defined, and a carbonyl bearing compound of the formula:

wherein either: (1) R_1' and R_2' are each alkyl of 1 to 5 carbon atoms with the proviso that R_1' and R_2' do not exceed a total of 6 carbon atoms; (2) R_2' is hydrogen and R_1' is optionally mono- or di-substituted phenyl or optionally mono-substituted furyl; and (3) R_1' and R_2' together form an alkylene bridge of 4 to 6 carbon atoms optionally mono-substituted by alkyl of 1 to 4 carbon atoms: comprising reacting at a temperature of from 0° to 35° C.; (A) said 2-unsubstitutedaminophenyl ketone, (B) a strong acid defined by having a strength of at least pH 2.0 in a 10% by weight aqueous solution, (C) a borohydride and (D) a stoichiometric amount of said carbonyl bearing compound, in a multi-component solvent comprising water and at least a 20% molar excess of said carbonyl bearing compound, the mol ratio of borohydride to the unsubstitutedaminophenyl ketone being at least 1.7:1, the mol rato of said acid to borohydride on a hydrogen ion mol equivalent basis being in excess of 1:1 and the individual solvent components and said acid each being in an actual amount and proportioned relative to each other and to said 2-unsubstitutedaminophenyl ketone such as to substantially initiate reaction within said temperature range in a substantially homogeneous solution.

4,071,558

AROMATIC POLYAMINES AND THEIR PREPARATION

Floyd E. Bentley, Austin, Tex., assignor to Texaco Development Corporation, New York, N.Y.

Continuation of Ser. No. 671,200, Sept. 28, 1967, abandoned, which is a continuation-in-part of Ser. No. 335,396, Jan. 2, 1964, abandoned, which is a continuation-in-part of Ser. No. 243,648, Dec. 10, 1962, abandoned. This application Dec. 12, 1969, Ser. No. 884,730

Int. Cl.² C07C *85/24*

U.S. Cl. 260—570 D **12 Claims**

1. A method for preparing a mixture of diaminodiphenylmethanes containing a predetermined percentage of 2,4'-isomers within the range of about 15 wt. % to about 90 wt. % which comprises the steps of:

A. reacting about 1 to about 10 mols aniline per mol formaldehyde in the presence of a solid acidic siliceous catalyst at a first temperature within the range of about 80° to about 150° C. to thereby provide a reaction product comprising diaminodiphenylmethane isomers, secondary amines and higher molecular weight condensation products of aniline and formaldehyde;

B. heating said mixture at a second temperature within the range of about 175° to about 250° C. for about 1 to about 5 hours to thereby convert said secondary amines to polyaminopolyphenylmethane compounds;

C. recovering said diaminodiphenylmethane isomers and higher molecular weight condensation products from the reaction mixture;

whereby the predetermined percentage of 2,4'-isomers is formed by selecting at least one of said first temperature or said second temperature as being the temperature at which the predetermined percentage of 2,4'-isomer is formed.

4,071,559

PHARMACEUTICALLY ACTIVE 2-OMEGA-AMINOALKOXYDIPHENYLS

Ryoji Kikumoto, Machida; Akihiro Tobe, Kawasaki; Shinji Tonomura, Tokyo; Hidenobu Ikoma, Kawasaki, and Kazuo Honda, Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

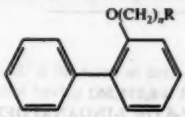
Filed Apr. 14, 1976, Ser. No. 676,871

Claims priority, application Japan, June 19, 1975, 50-74741

Int. Cl.² C07C *93/06*

U.S. Cl. 260—570.7 **5 Claims**

1. A compound having the formula (I):



(I)

wherein R is selected from the group consisting of amino, C_1-C_5 alkylamino and C_2-C_6 dialkylamino; n is 4; or a pharmaceutically acceptable acid addition salt thereof.

4,071,560

DIAMINOALDITOLS USEFUL IN THE PREPARATION OF ANTIBACTERIAL ANTIBIOTICS AM31α, AM31β, AND AM31γ

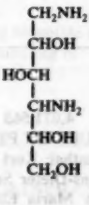
Jane Parsons Kirby, New City, and Donald Bruce Borders, Suffern, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 719,226, Aug. 31, 1976, abandoned, which is a division of Ser. No. 559,998, March 19, 1975, Pat. No. 3,987,029, which is a continuation-in-part of Ser. No. 436,008, Jan. 23, 1974, abandoned. This application Mar. 8, 1977, Ser. No. 775,505

Int. Cl.² C07C *91/12*

U.S. Cl. 260—584 R **3 Claims**

1. A compound selected from the group consisting of a diaminoalditol of the formula:



an' the acid-addition salts thereof.

4,071,561

METHOD OF PREVENTION OF DISTURBANCES AND/OR EFFECTS OF DISTURBANCES IN THE REACTION SYSTEM OF OXIDATION OF HYDROCARBONS IN A LIQUID PHASE UNDER PRESSURE WITH GASES CONTAINING OXYGEN

Stanislaw Ciborowski, Warsaw; Zbigniew Szczypinski, Tarnow; Kazimierz Balcerzak; Andrzej Jaworski, both of Warsaw; Andrzej Kasznia; Andrzej Krzysztoforski, both of Tarnow; Stanislaw Kurowski, Warsaw; Jan Redzi, and Jozef Szparski, both of Tarnow, all of Poland, assignors to Zaklady Azotowe im. F. Dzierzinskiego, Tarnow, Poland

Filed Oct. 10, 1975, Ser. No. 621,530

Claims priority, application Poland, Oct. 12, 1974, 174794

Int. Cl.² C07C *27/12, 29/00, 45/02, 51/33*

U.S. Cl. 260—586 P **5 Claims**

1. A method for the prevention of disturbances and effects of disturbances in a reaction system for the oxidation of hydrocarbons in the liquid phase under pressure with oxygen containing

gases which comprises lowering in the system, the temperature and pressure in the reactor and/or other apparatus of the reaction system by introduction of water in an intensive way at a rate and volume sufficient to lower the temperature of the hydrocarbon to at least 5° C. lower than the boiling point of its hydroazeotrope under atmospheric pressure, or to a temperature at which there does not occur an uncontrolled decomposition of hydroperoxides, while simultaneously preventing a momentary pressure increases due to hydroazeotrope evaporation.

4,071,562

4,5-DIALKOXY-6 OR 7-INDANALDEHYDES

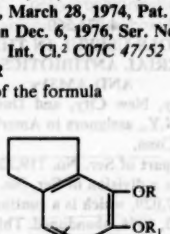
Ian William Mathison; William Ebenezer Solomons, both of Memphis, Tenn., and Raymond Henry Jones, Northport, N.Y., assignors to Marion Laboratories, Inc., Kansas City, Mo.

Division of Ser. No. 689,077, March 24, 1976, which is a division of Ser. No. 455,574, March 28, 1974, Pat. No. 3,963,723. This application Dec. 6, 1976, Ser. No. 747,533

Int. Cl.² C07C *47/52*

U.S. Cl. 260—600 R **2 Claims**

1. A compound of the formula



wherein R and R_1 are the same or different lower alkyl groups, and R_4 is CHO—.

4,071,563

MANUFACTURE OF PENT-4-EN-1-AL

Rudolf Kummer, Frankenthal; Kurt Schwirten, Ludwigshafen, both of Germany; Hans-Dieter Schindler, deceased, late of Neuried, Germany (by Maria Elisabeth Schindler, heir-at-law); by Ute Lang nee Schindler, heir-at-law, Neuried, and by Rainer Schindler, heir-at-law, Hechendorf, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

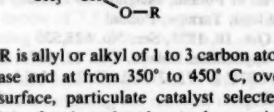
Filed Mar. 24, 1976, Ser. No. 669,844

Claims priority, application Germany, Apr. 19, 1974, 2517447

Int. Cl.² C07C *47/20*

U.S. Cl. 260—601 R **6 Claims**

1. A process for the manufacture of pent-4-en-1-al, wherein an acetaldehyde-acetal of the general formula



[I]

where R is allyl or alkyl of 1 to 3 carbon atoms, is passed in the gas phase and at from 350° to 450° C, over a non-oxidizing, active-surface, particulate catalyst selected from the group consisting of activated carbon, coke, pumice, silica, aluminum oxide, titanium dioxide, zinc oxide and aluminum oxide on which a thin layer of carbon has been applied.

4,071,564

PROCESS FOR THE PRODUCTION OF 2-ALKOXY-4-ALKENYL PHENOLS

Kurt Bauer, Holzminden; Reiner Mölleken, Golmbach Ortsteil Warbsen, and Fritz Exner, Holzminden, all of Germany, assignors to Haarmann & Reimer Gesellschaft mit beschrankter Haftung, Holzminden, Germany

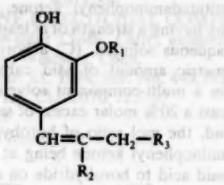
Filed Apr. 14, 1975, Ser. No. 568,090

Claims priority, application Germany, Apr. 19, 1974, 2418972

Int. Cl.² C07C *41/00*

U.S. Cl. 260—613 D **11 Claims**

1. A process for the production of 2-alkoxy-4-alkenyl phenols of the formula

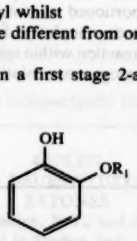


in which

R_1 is methyl or ethyl whilst

R_2 and R_3 which are different from one another, are hydrogen or methyl

comprising reacting in a first stage 2-alkoxy phenols of the formula



in which R_1 has the meaning given above with butyraldehyde or isobutyaraldehyde at a temperature from 0° to 100° C in the presence of an acid catalyst selected from the group consisting of sulphuric acid, hydrochloric acid, phosphoric acid, pyrophosphoric acid, sulphonic acid and acidic inorganic or organic ion exchangers and subsequently thermally splitting the condensation product obtained in a second stage by heating it at a temperature from 150° to 300° C in the presence of a basic catalyst selected from the group consisting of alkali or alkaline earth metals, aluminium, zinc, cadmium and lead and the oxides, hydroxides, alcoholates, phenolates, alkyl carboxylates, carbonates, amides or hydrides of the aforementioned metals.

4,071,565

BUTYLATED, α-METHYL STYRENATED PHENOLIC ANTIOXIDANTS

William S. Hollingshead, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 542,333, Jan. 20, 1975, Pat. No. 3,989,665. This application Feb. 23, 1976, Ser. No. 660,078

Int. Cl.² C07C *39/12*

U.S. Cl. 260—619 R **2 Claims**

1. A phenolic reaction product prepared by a two-step reaction comprising

a. reacting a combination comprising phenol and α-methyl styrene in the presence of a Friedel-Crafts catalyst, and

b. subsequently reacting the phenol/α-methyl styrene reaction product with isobutene in the presence of a Friedel-Crafts catalyst,

wherein the phenol/α-methyl styrene/isobutene molar ratio is from 1:0.5:0.5 to 1:2.5:2.5 and wherein the total molar amount of α-methyl styrene plus isobutene charged is from 2.5 to 3.5 moles per mole of phenol.

4,071,566

PREPARATION OF CRESOLS AND XYLENOLS FROM TETRAMETHYLPHENOLS AND PENTAMETHYLPHENOL

Bruce E. Leach, and Charles M. Starks, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Jan. 22, 1976, Ser. No. 651,667
Int. Cl.[2] C07C *39/04*
U.S. Cl. 260—621 D 10 Claims

1. A process for preparing cresols and xylenols which comprises reacting a mixture of tetramethylphenols and pentamethylphenol with phenol in the liquid phase in the presence of an effective amount of a catalyst selected from the group consisting of activated carbon, magnesium oxide, magnesium carbonate and magnesium hydroxide, said process being characterized further in that it is conducted at a temperature in the range of about 375° to about 500° C. and a pressure in the range of about 30 to about 125 atmospheres.

4,071,567

PROCESS FOR THE PRODUCTION OF METHYL TERT-BUTYL ETHER

Francesco Ancillotti, San Donato Milanese; Gianni Oriani, and Ermanno Pescarollo, both of Milan, all of Italy, assignors to Snamprogetti S.p.A., Milan, Italy

Continuation of Ser. No. 579,661, May 21, 1975, abandoned.
This application Aug. 12, 1976, Ser. No. 713,981
Claims priority, application Italy, May 21, 1974, 23013/74
Int. Cl.[2] C07C *41/06*; C06C *41/10*
U.S. Cl. 260—614 A 6 Claims

1. In a process for the production of methyl tert-butyl ether by reacting isobutylene with methanol at a pressure sufficient to maintain the liquid phase in the presence of a catalyst consisting of an acid ion exchange resin, the improvement which comprises the steps of:

(a) reacting in a first reactor in the presence of the catalyst at a temperature of from 60°–70° C (i) methanol and (ii) a mixture comprised of isobutylene, linear olefins, and methanol, the total quantity of methanol being in stoichiometric excess of the quantity of isobutylene;

(b) subjecting the product of step (a) to distillation to obtain an off gas comprised of linear olefins and less than 2 percent of isobutylene and a bottoms product comprised of methanol and tert-butyl ether;

(c) reacting in a second reactor in the presence of the catalyst at a temperature of from 60° to 70° C the bottoms product of step (b) with a mixture comprised of isobutylene and linear olefins, the space velocity of the mixture being in the range of 20 to 50 LHSV and the respective total quantities of methanol and isobutylene reacted in steps (a) and (c) being stoichiometrically equivalent; and

(d) subjecting the product of step (c) to distillation to produce an off gas comprised of isobutylene, linear olefins, and methanol, and a bottoms product comprised of methyl tert-butyl ether, the off gas being recycled as feed to the reactor in step (a).

4,071,568

PROCESS FOR PRODUCING GLYCOL MONOETHER

Takeru Onoda, Yokohama, and Shimpei Tomita, Kurashiki, both of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Nov. 29, 1976, Ser. No. 745,927
Claims priority, application Japan, Dec. 12, 1975, 50-148002; Dec. 17, 1975, 50-150386
Int. Cl.[2] C07C *41/00, 41/10*
U.S. Cl. 260—615 R 19 Claims

1. A process for producing a glycol monoether which comprises reacting

A. at least one member selected from the group consisting of

i. an acetal having the general formula:

$R^1OCHR^3OR^2$

wherein R^1 and R^2 are the same or different and represent an aliphatic or alicyclic radical of 1 to 8 carbon atoms, or aromatic hydrocarbon radicals of 6 to 7 carbon atoms, R^3 represents hydrogen, an aliphatic or alicyclic radical of 1 to 8 carbon atoms or aromatic hydrocarbons radicals of 6 to 7 carbon atoms and the hydrocarbon radicals may have a substituent inert to the reaction,

ii.

a. an aldehyde having the general formula:

R^3CHO

wherein R^3 is the same as defined above and

b. an alcohol having the general formula:

R^4OH

wherein R^4 is the same as R^1 or R^2, and

iii.

c. paraformaldehyde or trioxane and

d. an alcohol as defined above (b), with

B. carbon monoxide and

C. hydrogen

wherein the molar ratio of hydrogen/carbon monoxide is 0.1 to 10, in the presence of

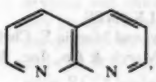
D. a catalyst comprising

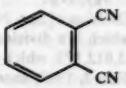
1. a cobalt compound selected from the group consisting of cobalt carbonyl, cobalt oxide, organic acid salts of cobalt and inorganic acid salts of cobalt, and

2. at least one compound selected from the group consisting of

e. trivalent organic phosphorus compounds selected from the group consisting of tertiary phosphines having an alkyl group of 1 to 8 carbon atoms, an aryl group of 6 to 7 carbon atoms or a cyclohexyl group, phosphines having two phosphorus atoms and tertiary phosphites corresponding to the above-mentioned phosphines,

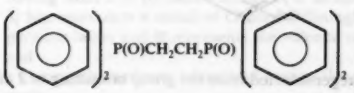
f. nitrogen-containing bidentate chelate ligand selected from the group consisting of





and dinitriles having the general formula: $NC(CH_2)_nCN$, wherein n is an integer of 1 to 10, and

g. oxygen-containing bidentate chelate ligand selected from the group consisting of $CH_3COCH_2COCH_3$, $CH_3CH_2OCOCH_2COOCH_2CH_3$ and



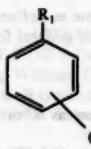
at a temperature of 50° to 300° C and under the pressure of 10 to 1,000 kg/cm^2 gauge.

4,071,569
PROCESS FOR PRODUCING PHENOLS

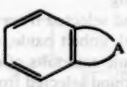
Takeshi Yamahara, Chiba; Tetsuo Takano, Takatsuki; Mitsuhisa Tamura, Osaka, and Hiroshi Yoshihara, Takatsuki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Apr. 26, 1976, Ser. No. 680,445
Claims priority, application Japan, May 2, 1975, 50-53481; May 23, 1975, 50-62321; June 4, 1975, 50-67763
Int. Cl.[2] C07C *39/06, 39/12*
U.S. Cl. 260—621 C 4 Claims

1. In the process for producing a phenol by cleaving a secondary alkylbenzene hydroperoxide selected from the group consisting of mono- and di-hydroperoxides of alkylbenzenes of the formula



wherein R_1 is ethyl, β-phenylethyl, benzyl or $-C_nH_{2n+1}$ in which n is an integer of 3 to 12, R_2 is hydrogen, C_1–C_8 alkyl, C_1–C_6 alkoxy or nitro, and m is an integer of 1 to 3, and monohydroperoxides of alkylbenzenes of the formula



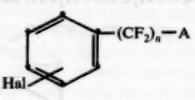
wherein A is C_3–C_5 alkylene, which comprises dissolving said secondary alkylbenzene hydroperoxide in an organic solvent which is inert to both the hydroperoxide and the cleavage product to form a solution, heating the solution in the presence of a catalyst at a temperature of 60° to 180° C and separating the desired phenol from the cleavage product, the said solution containing 5 to 30% by weight of the secondary alkylbenzene hydroperoxide, the improvement comprising using sulfur as said catalyst in an amount of 0.001 to 5% by weight based on the weight of the secondary alkylbenzene hydroperoxide.

4,071,570
ARYLPERFLUOROALKANES

Edward L. Engelhardt, Gwynedd Valley, and Marcia E. Christy, Perkasie, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 470,500, May 16, 1974, Pat. No. 3,978,127, which is a division of Ser. No. 102,130, Dec. 28, 1970, Pat. No. 3,812,177, which is a continuation-in-part of Ser. No. 799,945, Feb. 2, 1969, abandoned, which is a continuation-in-part of Ser. No. 712,616, March 13, 1968, abandoned. This application Feb. 20, 1976, Ser. No. 659,624
Int. Cl.[2] C07C *25/00*
U.S. Cl. 260—649 F 4 Claims

1. Compounds having the formula



wherein

n is an integer selected from the group consisting of 2 and 3;

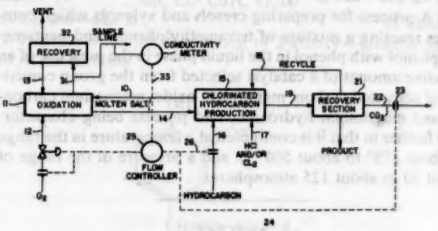
A is a phenyl ring;

Hal is a halogen selected from the group consisting of bromine and iodine.

4,071,571
CONTROL OF MOLTEN SALT OXIDATION IN PRODUCTION OF CHLORINATED HYDROCARBONS

Utah Tsao, Jersey City, N.J., assignor to The Lummus Company, Bloomfield, N.J.

Filed Feb. 23, 1976, Ser. No. 660,251
Int. Cl.[2] C07C *21/00*
U.S. Cl. 260—654 R 6 Claims



1. In a process for producing a chlorinated hydrocarbon in a chlorinated hydrocarbon production system by contacting in a first reaction zone a molten salt containing the higher and lower valent chlorides of a multivalent metal with molecular oxygen to produce the oxychloride of the multivalent metal, contacting in a second reaction zone the salt containing the oxychloride with a hydrocarbon to produce an effluent containing chlorinated hydrocarbon and carbon dioxide and venting a carbon dioxide containing stream from the chlorinated hydrocarbon production system, the improvement comprising:

decreasing the amount of oxygen employed in producing the oxychloride in the first reaction zone in response to an increase in the quantity of carbon dioxide in the vented carbon dioxide containing stream to decrease the quantity of oxychloride present in the molten salt and maintain the quantity of oxychloride present in the molten salt to below a predetermined amount and thereby limit carbon dioxide production.

4,071,572
CYCLIC ETHYLENE OXYHYDROCHLORINATION PROCESS WITH REDUCED HYDROCARBON EMISSIONS

Wayne S. Amato, Syracuse; Bhaskar Bandyopadhyay, Camillus; Robert Herbert Fitch, Syracuse, and Bruce Edward Kurtz, Marcellus, all of N.Y., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed June 17, 1975, Ser. No. 587,781
Int. Cl.[2] C07C *17/02*
U.S. Cl. 260—659 A 7 Claims

1. In a process for producing ethylene dichloride by the oxyhydrochlorination of ethylene wherein (1) ethylene, hydrogen chloride and substantially pure oxygen are fed to a reaction zone containing a Deacon-type catalyst and reacted therein to form ethylene dichloride, (2) a product stream containing ethylene dichloride, water, carbon dioxide, carbon monoxide and unreacted ethylene and oxygen is withdrawn from the reaction zone, and (3) ethylene dichloride and water are removed from the product stream and a major portion of the product stream is thereafter recycled to the reaction zone as a recycle stream, the improvement which comprises: monitoring the oxygen and ethylene content of the recycle stream and adjusting the feed rates of ethylene, hydrogen chloride and oxygen to the reaction zone so as to maintain in the recycle stream a concentration of ethylene within the range of from about 0.1 to 10% by volume, and a concentration of oxygen within the range of from about 0.1 to 10% by volume.

4,071,573

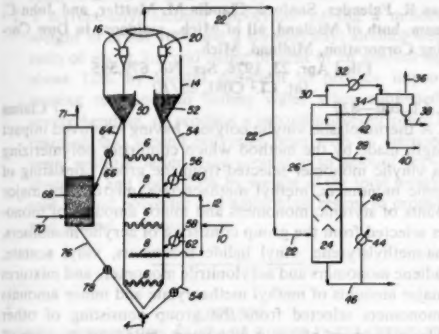
PROLONGING ZEOLITE CATALYST LIFE IN METHANOL CONVERSION TO GASOLINE BY DISPOSING OF EXOTHERMIC REACTION HEAT

Hartley Owen, Belle Mead, and Paul B. Venuto, Cherry Hill, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 506,157, Sept. 23, 1974, abandoned, which is a continuation-in-part of Ser. No. 470,084, May 15, 1974, abandoned. This application Oct. 20, 1976, Ser. No. 733,981

Int. Cl.[2] C07C *15/02*

U.S. Cl. 260—668 R 4 Claims



1. In a fluid catalyst operation for effecting the exothermic conversion of chemical reactants comprising hetero compounds selected from the group consisting of alcohols, halides, mercaptans, sulfides, amines, ethers and carbonyl compounds over catalyst particles comprising a crystalline zeolite selected from a class of crystalline zeolites represented by ZSM-5 crystalline zeolite providing a pore opening greater than 5 Angstroms, a silica-to-alumina ratio greater than 12 and a constraint index in the range of 1 to 12, wherein said catalyst with carbonaceous deposit is passed to a catalyst regeneration zone, wherein a mixture of catalyst particles and a reactant hetero compound in a ratio greater than 20 to 1 is formed at a temperature in the range of 400° to 900° F and is passed upwardly through a confined reaction zone as a suspension through a plurality of gas bubble dispersion zones within the reaction zone, and the suspension in the reaction zone is restricted to an exothermic temperature rise not to exceed 100°, followed by separating the suspension upon discharge from the reaction zone into a gasiform product phase and a catalyst particle phase, and directly recycling a portion of the separated catalyst particle phase for admixture with reactant material charged to said reaction zone; the improvement which comprises preheating said chemical reactants by indirect heat exchange within said gas bubble dispersion zones before being introduced into said reaction zone and maintaining the catalyst circulation rate to limit incremental carbon laydown to no more than 1 weight percent.

4,071,574

CONVERSION OF FISCHER-TROPSCH HEAVY PRODUCT TO HIGH QUALITY JET FUEL

Donald Milstein, and Thomas R. Stein, both of Cherry Hill, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 29, 1976, Ser. No. 671,451

Int. Cl.[2] C07C *1/04;* C10G *34/00*

U.S. Cl. 260—676 R 9 Claims

1. A process for producing a high-quality jet fuel which comprises hydrotreating a wide boiling range hydrocarbon fraction of Fischer-Tropsch synthesis comprising olefins and oxygenates and boiling in the range of about 350° to 850° F;

separating the product of hydrotreating to produce a 650° F minus overhead fraction and a 650° F plus bottoms fraction;

separating the overhead 650 minus fraction to produce a first overhead naphtha fraction comprising 350° F minus material from a 350° F plus bottoms fraction;

admixing at least a portion of said 350° F plus bottom fraction with said 650° F plus bottoms above recovered;

contacting the mixture thus formed with a catalyst comprising a special zeolite having a silica to alumina ratio of at least 12, and a constraint index of 1 to 12 at a temperature in the range of about 500° to 800° F, under hydrogen pressure in the range of about 100 to 800 psig and at a space velocity in the range of about 0.5 to 5 LHSV, to produce a product comprising a C_5 to 350 naphtha boiling range hydrocarbon fraction and a higher boiling distillate boiling range fraction; and

separating said higher boiling distillate fraction into a jet fuel boiling fraction and a higher boiling diesel fuel fraction.

4,071,575

PROCESS FOR PRODUCING 2,6-DIMETHYL-1,3,6-OCTATRIENE

Hiroyuki Morikawa, and Shoji Kitazume, both of Amimachi, Japan, assignors to Mitsubishi Petrochemical Company Limited, Japan

Filed Nov. 1, 1976, Ser. No. 737,069

Claims priority, application Japan, Nov. 11, 1975, 50-135541

Int. Cl.[2] C07C *3/18*

U.S. Cl. 260—677 R 12 Claims

1. A process for producing 2,6-dimethyl-1,3,6-octatriene which comprises contacting isoprene with a dimerization catalyst thereby to dimerize the isoprene, said dimerization catalyst comprising a combination of:

I. a zirconium compound selected from the group consisting of:

1. compounds having the general formula

$$ZrX_{4-n}Y_n,$$

2. compounds having the general formula

$$ZrOY'_2, \text{ and}$$

3. complexes of the compound (1) or (2) with a coordinating compound, wherein X represents a halogen atom; Y and Y′ respectively represent a member selected from the group consisting of (i) alkoxy and chloroalkoxy groups each having from 1 to 20 carbon atoms, (ii) aryloxy and chloroaryloxy groups wherein each aryloxy group is a member selected from the group consisting of phenoxy and methyl-substituted phenoxy groups, and (iii) acyloxy groups each having the general formula RCOO-wherein R is a member selected from the group consisting of alkyl groups each having from 1 to 20 carbon atoms and aryl groups each having from 6 to 20 carbon atoms; and n is an integer of 1 to 4:

II. an iodine compound which is a member selected from the group consisting of those having either of the general formulas

$$R'I_A \text{ and } MeI_B$$

wherein R′ represents a member selected from the group consisting of hydrogen, halogen atoms, straight and branched chain hydrocarbon groups each having from 1 to 20 carbon atoms and cyclic hydrocarbon groups each having from 3 to 10 carbon atoms; A is an integer of 1 to 3; Me represents a metal of Groups I through IV of the periodic table; and B represents the valence of the metal; and

III. an organoaluminum compound having the general formula.

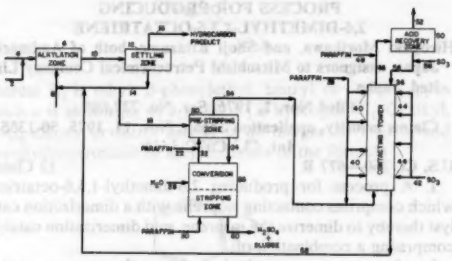
$$AlR''_m Cl_{3-M}$$

wherein R'' represents a member selected from the group consisting of alkyl groups each having from 1 to 10 carbon atoms, cyclic alkyl groups each having from 3 to 10 carbon atoms, and aryl groups each having 6 to 10 carbon atoms; and m is 1.5 or 2; in which dimerization catalyst, when iodine is present as a ligand in the zirconium compound I, the iodine compound II may be excluded.

4,071,576
PROCESS FOR REGENERATING FLUOROSULFURIC ACID CATALYST

William C. Behrmann, and Robert H. Caulk, both of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Feb. 28, 1977, Ser. No. 772,643
Int. Cl.[2] C07C 3/54
U.S. Cl. 260—683.47 **18 Claims**



1. In an alkylation process which comprises:

a. contacting an olefin with a paraffin in an alkylation zone under alkylation conditions and with a catalyst comprising fluorosulfuric acid to form a reaction mixture of fluorosulfuric acid catalyst phase containing an organic sludge formed during said process and a hydrocarbon phase containing alkylate product;

b. separating said hydrocarbon phase containing alkylate product from said fluorosulfuric acid catalyst phase the improvement which comprises regenerating said acid catalyst phase according to the following steps:

c. stripping a portion of the fluorosulfuric acid from the acid catalyst phase separated in step (b) with a paraffin to form a stripped acid phase containing fluorosulfuric acid and said organic sludge and a gaseous phase containing paraffin and fluorosulfuric acid;

d. contacting said stripped acid phase formed in step (c) with water to form an acid-water mixture, thereby converting at least a portion of the fluorosulfuric acid contained therein to hydrogen fluoride and sulfuric acid;

e. stripping at least a portion of the hydrogen fluoride from said acid-water mixture formed in step (d) with a paraffin to form a gaseous phase comprising hydrogen fluoride and paraffin and a liquid phase comprising sulfuric acid and sludge;

f. passing the gaseous phases formed in step (c) and step (e) into a contacting zone and cooling said phases therein with liquid paraffin to form a liquid-vapor mixture comprising a liquid phase containing fluorosulfuric acid and a vapor phase containing hydrogen fluoride, fluorosulfuric acid and paraffin;

g. treating the vapor phase formed in step (f) in said contacting zone with at least a stoichiometric amount of liquid sulfur trioxide based on hydrogen fluoride, a portion of said liquid sulfur trixoide being dissolved in a liquid stream of fluorosulfuric acid flowing countercurrent to the flow of said vapor to convert the hydrogen fluoride present therein to fluorosulfuric acid, thereby forming a liquid phase of regenerated fluorosulfuric acid and a gas phase containing predominantly paraffin and a minor amount of fluorosulfuric acid;

h. cooling the gas phase formed in step (g) to a temperature at which substantially all of the fluorosulfuric acid present therein in condensed, thereby forming a liquid phase containing predominantly regenerated fluorosulfuric acid and a gas phase containing substantially pure paraffin, and

i. using at least a portion of the liquid phase formed in step (h) as said liquid fluorosulfuric acid stream in step (g).

4,071,577
TOUGHENED MERCAPTOSILOXANE MODIFIED EMULSION POLYMERIZED VINYLIC POLYMERS

James R. Falender, Sanford; Claudia M. Mettler, and John C. Saam, both of Midland, all of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Apr. 23, 1976, Ser. No. 679,595
Int. Cl.[2] C08L 83/10
U.S. Cl. 260—827 **7 Claims**

1. A thermoplastic vinylic polymer having improved impact strength made by the method which comprises polymerizing (1) a vinylic monomer selected from the group consisting of styrenic monomers, methyl methacrylate, mixtures of major amounts of styrenic monomers and minor amounts of monomers selected from the group consisting of acrylic monomers, alpha-methylstyrene, vinyl halide monomers, vinyl acetate, butadiene monomers and acrylonitrile monomers and mixtures of major amounts of methyl methacrylate and minor amounts of monomers selected from the group consisting of other acrylic monomers, styrenic monomers, butadiene monomers, vinyl halide monomers, vinyl acetate, alpha-methylstyrene, and acrylonitrile monomers, in an aqueous emulsion of (2) a copolymer of dimethylsiloxane, from 0.3 to 10 mol percent mercaptosiloxane of the unit formula $HSR'SiR_nO_{3-n/2}$ in which R' is a divalent or trivalent saturated aliphatic hydrocarbon radical of 1 to 18 carbon atoms, two valences of R' being attached to the same silicon atom when R' is trivalent, R is a monovalent hydrocarbon radical free of aliphatic unsaturation of 1 to 6 carbon atoms and n is 0 to 2 and sufficient $R''SiO_{3/2}$ or SiO_2 units to give a percent volume swell of the copolymer of 500 to 1,600 percent in benzene, R'' being of the group HSR'— and R groups, in the presence of a free radical generator, whereby a thermoplastic matrix having dispersed therein particles of (2) is obtained, the proportions of (1) and (2) being from 1 to 40 percent by weight (2) based on the combined weights of (1) and (2).

4,071,578
ONE-COAT POLYESTER-BASED COATING AND METHOD OF MAKING SAME

Edward A. Lasher, Beverly Hills, Calif., assignor to Whittaker Corporation, Los Angeles, Calif.

Division of Ser. No. 331,228, Feb. 9, 1973, abandoned. This application June 30, 1975, Ser. No. 591,739
Int. Cl.[2] C08L 61/32, 29/08
U.S. Cl. 260—850 **4 Claims**

1. A method of making a one-coat, coatings formulation, comprising the steps of: esterifying a reaction mixture comprising

a. about 5% to about 9% by weight of a triol selected from the group consisting of trimethylol ethane, trimethylol propane, trimethylol butane, hexanetriol and pentanetriol,

b. about 35% to about 48% by weight of a diol selected from the group consisting of 1,2 and 1,3 propylene glycol, 1,3 and 1,4 butylene glycol, 1,5 pentane diol, 1,6 hexanediol, cyclohexane dimethanol, 2-ethyl, 2-methyl, 1,3 propane diol, neopentyl glycol, diethylene glycol and dipropylene glycol,

c. about 21% to about 42% by weight of a cyclic dicarboxylic acid selected from the group consisting of orthophthalic acid, isophthalic acid, terephthalic acid, tetrahy-

drophthalic acid, hexahydrophthalic acid, endomethylene tetrahydrophthalic acid, and anhydrides thereof,

d. about 5% to 15% by weight of an unsaturated aliphatic dicarboxylic acid selected from the group consisting of maleic acid, itaconic acid, fumaric acid, citraconic acid, mesoconic acid, teraconic acid, and anhydrides thereof,

e. about 16% to about 23% by weight of a saturated, aliphatic dicarboxylic acid selected from the group consisting of malonic acid, succinic acid, glutaric acid, adipic acid, suberic acid, azelaic acid, trimethyl adipic acid, sebacic acid, dodecyl succinic acid and anhydrides thereof, and then reacting the resulting first, polyester resin obtained by said esterification with

f. a styrene-allyl alcohol copolymer having a molecular weight of about 1600 and a styrene/allyl alcohol weight ratio of about 3:1, and being present in an amount up to about 12% by weight sufficient to provide improved coating resistance to boiling water when subjected to severe bending, to produce a second polyester resin; and reacting said second polyester resin with an aminoplast resin, with the latter being present in an amount between about 5% and about 25% by weight of the total weight of said second polyester and aminoplast resins, to cross-link said second polyester resin.

4,071,579

NOVEL PERESTERS SUITABLE FOR INITIATING THE POLYMERIZATION OR COPOLYMERIZATION OF ETHYLENICALLY UNSATURATED COMPOUNDS

Hendrik Harm Jannes Oosterwijk, Diepenveen, Netherlands, assignor to Akzona Incorporated, Asheville, N.C.

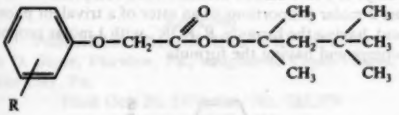
Division of Ser. No. 592,080, June 30, 1975, Pat. No. 4,016,187. This application Sept. 7, 1976, Ser. No. 721,045

Claims priority, application Netherlands, July 5, 1974, 7409110

Int. Cl.² C08F *14/06, 4/34;* C08K *5/04;* C08L *67/06*

U.S. Cl. 260—866 **8 Claims**

1. A process for polymerizing an ethylenically unsaturated compound or the copolymerization of at least two ethylenically unsaturated compounds in the presence of an initiating amount of a perester having the formula



where R represents hydrogen or an alkyl group or an alkoxy group having 1–6 C-atoms.

4,071,580

GRAFT POLYMERS

Heinrich Alberts, Cologne, and Herbert Bartl, Odenthal, both of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Feb. 27, 1976, Ser. No. 662,263

Claims priority, application Germany, Mar. 4, 1975, 2509403

Int. Cl.² C08F *255/02, 263/04, 263/02*

U.S. Cl. 260—878 R **14 Claims**

1. A process for preparing a graft polymer from ethylene homopolymer or copolymer and olefinically unsaturated monomers in the presence of a radical forming agent in homogeneous or heterogeneous phase, wherein a monomer mixture of acrylonitrile or methacrylonitrile, at least one aromatic monovinyl compound and vinyl chloride are polymerized in the presence of an ethylene homopolymer or copolymer.

4,071,581

PROCESS FOR PREPARING MODIFIED POLYOLEFIN WAXES

Nobuo Yokoyama, Yokohama, Japan, assignor to Nippon Oil Co., Ltd., Tokyo, Japan

Filed Mar. 2, 1977, Ser. No. 773,717

Claims priority, application Japan, Mar. 8, 1976, 51-24078

Int. Cl.² C08F *8/46, 255/02*

U.S. Cl. 260—878 R **4 Claims**

1. A process for preparing a modified polyolefin wax having improved hardness and gloss, comprising reacting a waxy polyolefin having a molecular weight of 400 – 5,000 with maleic anhydride at a temperature of 120° –300° C to obtain a maleinised wax and then reacting the thus-obtained maleinised wax with water in an amount of 2 – 80 parts by weight per 100 parts by weight of the maleic anhydride reacted with the waxy polyolefin, at a temperature of 100° – 180° C.

4,071,582

METHOD OF POLYMERIZING VINYL HALIDE WITH OLEFIN POLYMERS AND COPOLYMERS AND COMPOSITIONS THEREOF

Akio Takahashi, Amherst, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 427,895, Dec. 26, 1973, which is a continuation-in-part of Ser. No. 251,099, May 8, 1972, abandoned. This application Apr. 5, 1976, Ser. No. 674,202

Int. Cl.² C08F *279/00*

U.S. Cl. 260—878 R **28 Claims**

1. In a process for the preparation of a vinyl chloride polymer comprising polymerizing in bulk in liquid phase in the presence of a trunk polymer and a free radical initiator compound for said polymerization, a vinyl halide monomer either alone or in combination with up to 50% by weight based on the total weight of monomer, of another ethylenically unsaturated monomer copolymerizable therewith, the improvement which comprises carrying out the polymerization in the presence of about 0.05% to about 20% by weight, based upon said vinyl halide monomer, of a trunk polymer consisting essentially of an olefin trunk polymer of at least two aliphatic hydrocarbon olefin monomers of 2 to 8 carbon atoms and no more than 15% by weight, based on the weight of said olefin polymer of an aliphatic hydrocarbon non-conjugated polyene of 4 to 18 carbon atoms, said olefin polymer being soluble, partially soluble, or dispersible in said monomer or monomers, and said olefin polymer having a weight average molecular weight of about 50,000 to about 1,000,000.

4,071,583

CYCLIC PHOSPHONATES

Ingenuin Hechenbleikner, West Cornwall, Conn., assignor to Borg-Warner Corporation, Chicago, Ill.

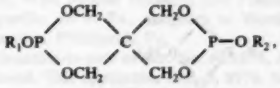
Division of Ser. No. 565,699, April 7, 1975, Pat. No. 3,978,166. This application June 10, 1976, Ser. No. 694,580

The portion of the term of this patent subsequent to Aug. 31, 1993, has been disclaimed.

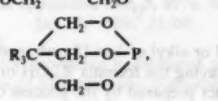
Int. Cl.² C07F *9/40*

U.S. Cl. 260—927 R **81 Claims**

1. A process of (A) preparing a phosphonate consisting essentially of heating an alcohol with a phosphite until said phosphonate forms, said phosphite having a formula selected from the group consisting of:

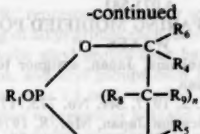


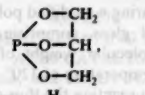
(1)

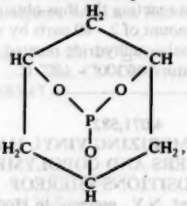


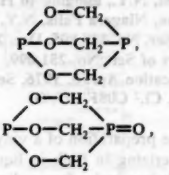
(2)

-continued


(3)

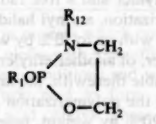

(4)


(5)


(6)

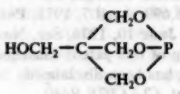
(7)

and

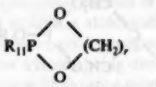

(8)

where R_1 and R_2 are alkyl, alkenyl or aralkyl, R_3 is alkyl of 1 to 17 carbon atoms or hydroxymethyl, R_4, R_5, R_6, R_7, R_8 and R_9 are hydrogen or lower alkyl and R_{12} is alkyl of 1 to 18 carbon atoms and n is 0, 1 or 2,

said alcohol having the formula R_{13} OH or the formula $HOR_{15}OH$ where R_{13} is normal alkyl of 3 to 4 carbon atoms or the residue of a monohydric alcohol having a pKa below that of n-propyl alcohol from which residue the OH is removed and R_{15} is $—CH_2—(R_{16})_m—CH_2—$ where R_{16} is alkylene and m is zero or an integer, or (B) preparing a chass-linked polymeric phosphonate by heating at 160° to 250° C. pentaerythritol phosphite of the formula


(9)

without another alcohol until it self polymerizes to form said phosphonate, or (C) preparing a phosphinate by heating a phosphonite with an alcohol until said phosphinate forms, said phosphonite having the formula


(10)

where R_{11} is aryl or alkyl of 1 to 18 carbon atoms and r is 1 to 2, said alcohol having the formula $R_{13}OH$ or $HOR_{15}OH$.

65. The product prepared by the process of claim 1.

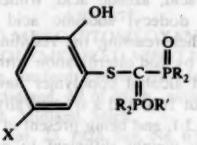
4,071,584

HYDROXYPHENYLTHIOPHOSPHORANYLIDENE ORGANOPHOSPHORUS COMPOUNDS

Gail H. Birum, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jan. 3, 1977, Ser. No. 756,504
Int. Cl.² C07F 9/08; C08K 5/53
U.S. Cl. 260—932 **6 Claims**

1. As a composition of matter



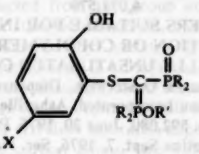
where

X is Br, Cl, F, CF_3, NO_2, CN, CO_2R', SO_2R' or

R is phenyl, alkyl of 1 to 3 carbon atoms, OR', and

R' is alkyl of 1 to 6 carbon atoms.

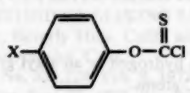
2. Process for the production of compounds of the formula



where

X is Br, Cl, F, CF_3, NO_2, CN, CO_2R', SO_2R', or

and R is phenyl, alkyl of 1 to 3 carbon atoms, OR', and R' is alkyl of 1 to 6 carbon atoms, which comprises contacting at least 2 molar proportions of an ester of a trivalent phosphorus acid, having the formula, R_2POR', with 1 molar proportion of a compound having the formula



at a temperature of 0° to 100° C.

4,071,585

VARIABLE VENTURI TYPE CARBURETOR

Masami Konishi, Toyota; Norihiko Nakamura, Mishima; Takaaki Itou, and Kazuo Kikuchi, both of Susono, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha and Aisan Industry Company, Limited, both of, Japan

Filed Mar. 29, 1977, Ser. No. 782,394
Claims priority, application Japan, Dec. 29, 1976, 51-15947
Int. Cl.² F02M 1/10
U.S. Cl. 261—36 A **17 Claims**

1. A variable venturi type carburetor of an internal combustion engine, comprising:

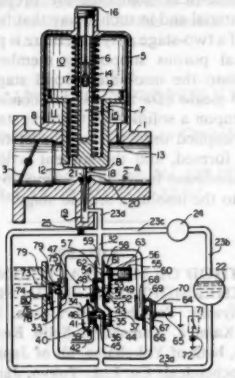
a housing;

a bore extending through said housing and having an inner wall defining an intake passage;

a suction piston movably mounted in said housing and having a bottom end face projecting into said intake passage, said bottom end face of said suction piston and said inner wall of said intake passage defining a venturi, said suction piston moving up and down in response to a change in the vacuum produced in said intake passage downstream of said venturi for maintaining the velocity of air flowing into said venturi at a constant value;

a jet disposed on the inner wall of said intake passage at a position facing said bottom end face of said suction piston;

a needle fixed onto said bottom end face of said suction piston and entering into said jet, said jet and said needle



defining an annular opening throough which fuel is injected into said intake passage;

a fuel reservoir;

a fuel recirculating pump having a suction side;

a fuel recirculating passage communicating said fuel reservoir with the suction side of said fuel recirculating pump;

a restricted opening disposed in said fuel recirculating passage for forming a vacuum zone in said fuel recirculating passage located between said restricted opening and the suction side of said fuel recirculating pump, and;

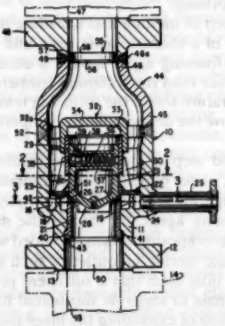
a fuel supply passage communicating said vacuum zone with said jet.

4,071,586

VARIABLE ORIFICE DESUPERHEATER

Fritz O. Seger, Fairview, Pa., assignor to Copes-Vulcan, Inc., Lake City, Pa.

Filed Oct. 26, 1976, Ser. No. 735,279
Int. Cl.[2] B01F *3/04*
U.S. Cl. 261—62 **11 Claims**



1. In a variable orifice steam desuperheater unit adapted for in-line operation in conjunction with steam piping upstream and downstream therefrom and of the type comprising

a. upper and lower housing sections joined together to form a mixing chamber of enlarged diameter relative to the upstream and downstream piping,

b. said joined housing sections being adapted for connection to said upstream and downstream piping,

c. an orifice plate fixed in said lower housing and forming therewith an annular water injection chamber provided with an annular atomizing orifice,

d. said water inlet chamber being adapted for connection to water inlet piping, to supply water to said orifice,

e. an axially disposed valve guide structure mounted on the downstream side of said orifice plate,

f. a generally cylindrical valve plug slideably received in said guide structure, and

g. annular means forming a valve seat for cooperation with said valve plug in the region of said atomizing orifice, the improvement characterized by,

h. said lower housing being of unitary construction and extending from a region substantially below said orifice to a region substantially above said orifice,

i. said upper and lower housings being secured together by an annular housing weld in the general region of said valve and valve guide structure,

j. said lower housing having an inlet opening sufficiently large to accommodate axial insertion of said valve plug through said inlet opening and into said valve guide structure,

k. said inlet opening being adapted for connection with the upstream steam piping,

l. said annular means comprising a sleeve-like insert adapted for upward axial telescopic insertion into said inlet opening after insertion of said valve plug and being fixedly secured therein below said valve plug,

m. said sleeve-like insert forming an annular valve seat for cooperation with said valve plug.

4,071,587

METHOD OF MAKING ZRH FUEL ELEMENT

George H. Eggers, San Diego, Calif., assignor to General Atomic Company, San Diego, Calif.

Filed Sept. 25, 1975, Ser. No. 616,584
Int. Cl.[2] G21C *21/00*
U.S. Cl. 264—.5 **10 Claims**

1. A method of making a nuclear fuel element for a nuclear fission reactor, which method comprises

providing a solid body of an alloy of zirconium and nuclear fuel metal containing nuclear fuel metal in an amount of between about 5 and about 20 weight percent,

exposing said body to hydrogen at an elevated temperature to transform said zirconium to zirconium hydride having a hydrogen-to-zirconium ratio of at least about 1.5 to 1,

exposing said hydrided alloy to oxygen at a temperature below said elevated temperature to form a continuous oxide layer about the exterior surface of said body and

enclosing said hydrided alloy in a gastight container to form a nuclear fuel element.

4,071,588

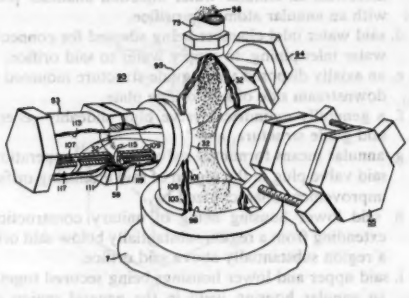
PROCESS FOR PRODUCTION OF MAGNETITE SPHERES WITH AN ARC HEATER

Maurice G. Fey, Plum Borough; Charles B. Wolf, Irwin; Paul E. Martin, West Mifflin Borough, and Francis J. Harvey, II, Murrysville, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 603,578, Aug. 11, 1975, abandoned. This application Dec. 9, 1976, Ser. No. 748,794
Int. Cl.[2] B29C *23/00*
U.S. Cl. 264—15 **9 Claims**

1. A process for producing particulated magnetite spheres by thermal fusion of magnetite ore, comprising:

a. striking an electric arc in an axial gap between generally hollow, cylindrical electrodes, said electrodes forming a chamber for said arc,
b. causing the arc to rotate and form a substantially cylindrical arc path between the electrodes,
c. directing gas through the gap into the arc chamber to thereby form an elongated arc heated gas jet,



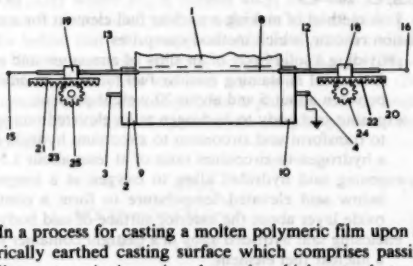
d. introducing particles of magnetite ore having a non-spherical shape with sufficient momentum into the arc heated gas jet to melt the particles to effect spheriodization by formation of droplets by surface tension, and
e. cooling the droplets to solid state to preserve sphericity.

4,071,589

QUENCHING OF POLYMERIC FILM

Raymond John Latham, Stoke-on-Trent, and Arthur John Holloway, Hertford, both of England, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 498,852, Aug. 19, 1974, Pat. No. 3,982,863, which is a continuation-in-part of Ser. No. 358,346, May 8, 1973, abandoned. This application Apr. 14, 1976, Ser. No. 676,673
Claims priority, application United Kingdom, May 12, 1972, 22341/72
Int. Cl.² B29D *7/22*
U.S. Cl. 264—22 **5 Claims**



1. In a process for casting a molten polymeric film upon an electrically earthed casting surface which comprises passing the film past a pinning wire electrode which extends transversely across the casting surface and is connected to a high voltage electrical source, the pinning wire being supported in spaced relation from the molten film and depositing electrostatic charges upon the molten film from the pinning wire electrode in the proximity of or prior to the region of first contact of the film and the casting surface, the pinning wire electrode being electrically insulated by dielectric insulators located beyond the film edges, the improvement which comprises monitoring the film by means of a sensor for any transverse fluctuations which may occur in the film edges and moving the dielectric insulators along the wire electrode by an amount corresponding to any such transverse fluctuations in response to said sensor whereby sparking between the wire electrode and the margins of the casting surface is impeded.

4,071,590

COMPOSITE ASYMMETRICAL MEMBRANES

Heinrich Strathmann, Tubingen, Germany, assignor to Forschungsinstitute Bergof GmbH, Turbingen, Germany

Filed Oct. 31, 1975, Ser. No. 627,684
Claims priority, application Germany, Nov. 2, 1974, 2452026
Int. Cl.² B01D *39/04*
U.S. Cl. 264—45.1 **4 Claims**

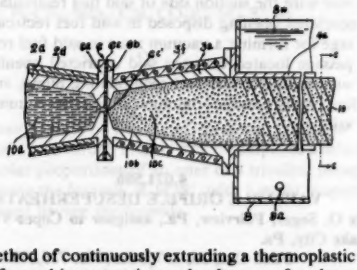
1. Process for the manufacture of composite asymmetrical membranes in the form of film, hollow fibre or tube membranes from polymers, by applying a thin film as filtration membrane onto a porous supporting membrane, characterized in that the supporting membrane and the filtration membrane of the composite asymmetrical membrane are prepared from the same polymer material and in such a way that from a solution of the first stage of a two-stage polymer, there is prepared an integral-asymmetrical porous supporting membrane which is then converted into the insoluble second stage of the two-stage polymer by means of a thermal or chemical cyclisation reaction, whereupon a solution of the first stage of the two-stage polymer is applied onto the surface of the supporting membrane thus formed, and the solvent is then evaporated, the filtration membrane being thus formed by conversion of the polymer into the insoluble second stage.

4,071,591

METHOD OF MANUFACTURING FOAMED THERMOPLASTIC RESIN PROFILES

Seizo Kobayashi; Toshiharu Hirayama, both of Yokohama; Takeshi Kamiya, Kamakura; Seiju Kezuka, and Hidesuke Takeuchi, both of Yokohama, all of Japan, assignors to Nippon Petrochemicals Co. Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 367,806, June 7, 1973, abandoned. This application Aug. 11, 1975, Ser. No. 603,766
Int. Cl.² B29D *27/00*
U.S. Cl. 264—45.3 **6 Claims**



1. A method of continuously extruding a thermoplastic body having a foamed inner portion and a dense surface layer from a thermoplastic resin selected from the group consisting of polyethylene, polypropylene, polystyrene and a mixture thereof comprising:
a. a first step of melting and kneading in a screw extruder a mixture of a thermoplastic resin and a thermally decomposable foaming agent having a decomposition temperature higher than the softening temperature of the resin, at a temperature above the softening temperature of the resin and below the decomposition temperature of the foaming agent;
b. a second step of heating the resulting mass of molten mixture, under pressure without substantial mixing action, to a temperature above the decomposition temperature of the foaming agent, by forcing the mass through a thermally decomposing means provided with external heating means and having an outlet of such smaller cross-section than its inlet such that a sufficient pressure is maintained on the mass to suppress substantial foaming in the mass;
c. a third step of expanding the inner portion of the mass and simultaneously suppressing substantial foaming in the exterior surface of the mass under reduced pressure by

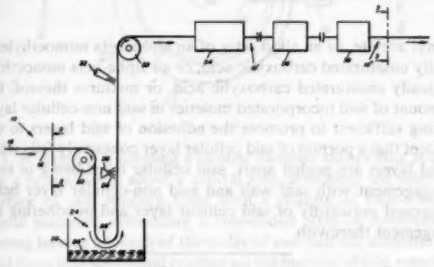
forcing the mass through a foaming die having an outlet of larger cross-section than its inlet, said foaming die including a channel and walls, the walls of the channel being maintained at such low temperature, which is below the decomposition temperature of the foaming agent, but above the softening temperature of said resin, as to cool, and thereby suppress substantial foaming in the exterior surfaces of the mass which are in contact with those walls; and

d. a fourth step of rapidly cooling the mass to a temperature below the softening temperature of the resin, by forcing the mass through a sizing die, which is a channel having walls maintained at a sufficiently low temperature such that the exterior surfaces of the mass, being in contact with said walls, are solidified within 10 seconds after the mass has been introduced into the channel.

4,071,592
METHODS OF SALVAGING IMPROPERLY PROCESSED RESINOUS

Rudolf Frisch, Yardley, Pa., assignor to Congoleum Corporation, Kearny, N.J.

Filed Nov. 25, 1975, Ser. No. 635,197
Int. Cl.[2] B29D *7/20, 27/02*
U.S. Cl. 264—54 **10 Claims**



1. In the art of making chemically embossed sheets of resinous material, a method of salvaging a backing sheet material and a potentially foamable, gelled plastisol composition on which has been improperly applied a printing ink composition containing an organic anhydride blow-modifier which comprises: (1) applying a potentially foamable plastisol composition containing a blowing agent to a backing sheet material; (2) heating said potentially foamable plastisol composition to a temperature of from about 240° to about 420° F. whereby it gels and becomes firm without being blown or foamed; (3) applying a printing ink composition containing an organic anhydride blow-modifier to the gelled, potentially foamable plastisol composition; (4) inspecting the application of said printing ink composition containing said anhydride blow-modifier within about 4 hours after application to determine the appropriateness of such application and, if said printing ink composition is improperly applied; (5) treating said printing ink composition containing said anhydride blow-modifier and said potentially foamable, gelled plastisol composition with a neutralizing and negating composition capable of rendering substantially ineffectual the blow-modifying properties of said anhydride blow-modifier without rendering ineffectual the blowing properties of said potentially foamable, gelled plastisol composition, said neutralizing and negating composition comprising (a) a water soluble chemical having a solvent, swelling and softening effect on said printing ink composition and (b) a reactive chemical capable of reacting with said anhydride blow-modifier, said neutralizing and negating composition being in contact with said printing ink composition for a total exposure time of from about 2 seconds to about 30 seconds; (6) reprinting said potentially foamable, gelled plastisol composition with a printing ink composition containing a blow-modifier; and (7) blowing said potentially foamable, gelled plastisol composition, whereby chemically embossed effects are obtained as a result of said blow-modifier used in the reprinting process, rather than said blow-modifier used in the initial printing process.

4,071,593
PROCESS FOR MAKING A PITCH IMPREGNATED, COLD MOLDED REFRACTORY ARTICLE

Grant M. Farrington, Downingtown, Pa.; J. Donald Harris, Beamsville, Canada, and Alfred H. Foessel, Baltimore, Md., assignors to General Refractories Company, Bala Cynwyd, Pa.

Continuation-in-part of Ser. No. 413,250, Nov. 6, 1973, Pat. No. 3,903,025. This application Aug. 29, 1975, Ser. No. 608,904
Int. Cl.[2] C04B *35/84*
U.S. Cl. 264—62 **8 Claims**

1. A method for making a shaped refractory article comprising the steps of:

a. preparing a refractory molding mix by blending particulate refractory material with 3.0% to 8.0% by weight of a binder composition comprising:

i. 10% to 40% by weight pitch;

ii. 25% to 80% by weight of an aqueous solution of a water-soluble resin, which solution contains from 40% to 60% by weight of the watersoluble resin; and

iii. 10% to 35% by weight of an organic solvent solution of a thermosetting polymer, which solution contains from 60% to 100% by weight of the thermosetting polymer;

b. shaping the refractory molding composition into a shaped refractory article at room temperature;

c. heating the shaped article to a temperature in the range of from about 200° F to about 1,000° F to form a cold pitch bonded shaped article; and (d) impregnating the cold pitch bonded shaped article under vacuum with a liquid impregnation medium containing a material selected from the group consisting of coal tar pitch, petroleum pitch, and mixtures thereof.

4,071,594
PRODUCTION OF CONTINUOUS CERAMIC FIBERS

Alan Pearson, St. Louis, and Leroy D. Hart, Crestwood, both of Mo., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation of Ser. No. 502,676, Sept. 3, 1974, which is a continuation-in-part of Ser. No. 269,343, July 6, 1972, abandoned. This application Feb. 24, 1976, Ser. No. 660,813
Int. Cl.[2] D01D *5/04;* **C04B** *35/10*
U.S. Cl. 264—63 **17 Claims**

1. In the fabrication of polycrystalline ceramic oxide fibers the steps of

1. forming elongate green thread from a substantially non-aqueous slip consisting essentially of not more than 80 weight percent of discrete temperature stable phase crystalline particles of ceramic oxides selected from the group consisting of alumina, zirconia, zircon, magnesia, chromia, iron oxide, spinel or combinations thereof, the said particles constituting substantially all of the ceramic oxide content of said slip and having a median diameter of 0.05 to 2.5 microns, dispersed in a volatile organic solvent consisting essentially of a halogenated hydrocarbon which solvent contains dissolved therein a linear chain polyethylene oxide polymer binder having an average molecular weight of at least about 400,000 and present in amounts of 0.5 to 5% of the solvent weight, said organic solvent having a surface tension of not over 50 dynes per centimeter and being selected as to dissolve said amount of polyethylene oxide polymer and form a pituitous slip therewith,

2. displacing the green thread substantially concurrent with its formation through an evaporative environment to remove sufficient volatile fluid therefrom to render the thread substantially self-supporting, while attenuating said

green thread to increase its length and decrease its diameter by a factor of at least 4, said attenuation being effected by exerting on said green thread a tensile force to effect movement of the green thread at a higher rate than its rate of formation,

3. and sintering the green thread to produce a coherent polycrystalline ceramic oxide fiber in the said temperature stable phase having a ceramic bond intermediate the particles thereof.

4,071,595

METHOD OF FORMING FLUORITE BRIQUETTES

Karl R. Komarek, Chicago, and Richard K. Komarek, Elk Grove Village, both of Ill., assignors to Lost River Mining Corporation Limited, Toronto, Canada

Continuation of Ser. No. 450,601, March 13, 1974, abandoned. This application Jan. 6, 1976, Ser. No. 646,920

Int. Cl.[2] C04B *35/64;* F27B *9/04;* B29F *5/00;* C22B *1/11*

U.S. Cl. 264—66 **1 Claim**

1. A method of forming fluorite briquettes, from a +80% fluorite flotation concentrate of an ore floatation concentration process, in the form of a fine dry powder, without the addition of a binder, comprising the steps of:

a. preheating the fine powder concentrate to a temperature in the range of 250° F to 1000° F,

b. briquetting said preheated fine powder concentrate between the rollers of a roll press at pressures of the order of about 60,000 p.s.i., and discharging the briquettes from the roll press and thereafter

c. firing the briquettes to a temperature of about 1500° F to form solid dust free briquettes.

4,071,596

PROCESS FOR MAKING HIGH SHRINKAGE ACRYLIC FIBERS

Merton Louis Davis, Camden, S.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 588,610, June 20, 1975, Pat. No. 4,011,294, which is a continuation-in-part of Ser. No. 481,374, June 18, 1974, abandoned. This application Nov. 22, 1976, Ser. No. 743,674

Int. Cl.[2] D01F *6/18*

U.S. Cl. 264—168 **4 Claims**

1. In the process of preparing acrylic fibers wherein as-spun, dry-spun filaments of acrylonitrile polymers are extracted to remove solvent by passing the filaments continuously through aqueous baths, drawn between 1.5 and 3.5× during passage through the baths and thereafter dried; the improvement for preparing high shrinkage fibers having high shrinkage force which comprises passing the as-spun filaments through the aqueous baths in which they are drawn at bath temperatures of 63° to 75° C and then cooling the filaments in a condition free to relax to a temperature below 50° C, then passing the filaments continuously through at least one aqueous bath at a temperature of 70° to 80° C while further drawing the filaments between 1.1× and 1.5× and then drying the filaments at a temperature no higher than 60° C.

4,071,597

CONTAINER WITH IMPROVED HEAT-SHRUNK CELLULAR SLEEVE

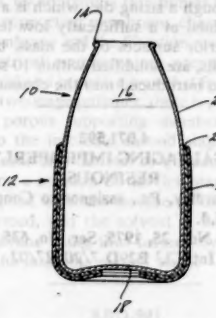
James A. Karabedian, Garden City, N.Y., assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 505,646, Sept. 13, 1974, abandoned. This application Feb. 3, 1976, Ser. No. 660,307

Int. Cl.[2] B29D *7/20*

U.S. Cl. 264—230 **8 Claims**

1. In a method wherein a heat-shrinkable, polymeric sheet is formed into a sleeve, having a major orientation circumferentially of said sleeve, and the sleeve telescopically located about the sidewall of a container and heat-shrunk into snug engagement with said sidewall, the improvement wherein said polymeric sleeve is a composite structure of two adhering layers comprising a closed cellular polymeric layer preponderantly of polystyrene having incorporated therein, in an amount from zero weight percent up to compatible amounts, a copolymer of ethylene and vinyl acetate, or a copolymer of ethylene and an alkyl ester of an alpha-beta monoethylenically unsaturated carboxylic acid, or a copolymer of ethylene and an alpha-beta monoethylenically unsaturated carboxylic acid, or mixtures thereof, and a non-cellular polymeric layer having preponderantly ethylene moieties and incorporated therein moieties of



vinyl acetate, or an alkyl ester of an alpha-beta monoethylenically unsaturated carboxylic acid, or an alpha-beta monoethylenically unsaturated carboxylic acid, or mixtures thereof, the amount of said incorporated moieties in said non-cellular layer being sufficient to promote the adhesion of said layers to the extent that a portion of said cellular layer cohesively fails when said layers are peeled apart, said cellular layer being in snug engagement with said wall and said non-cellular layer being disposed outwardly of said cellular layer and in adhering engagement therewith.

4,071,598

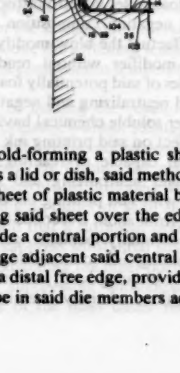
METHOD FOR COLD-FORMING PLASTIC SHEET

William R. Meadors, Marion, Ind., assignor to Peerless Machine & Tool Corporation, Marion, Ind.

Continuation of Ser. No. 619,377, Oct. 3, 1975, abandoned. This application Feb. 23, 1977, Ser. No. 771,407

Int. Cl.[2] B29D *23/12*

U.S. Cl. 264—295 **3 Claims**



1. A method of cold-forming a plastic sheet to provide a container part such as a lid or dish, said method comprising the steps of engaging a sheet of plastic material between opposing die members, drawing said sheet over the edge of one of said die members to provide a central portion and a depending skirt having a proximal edge adjacent said central portion, an intermediate portion, and a distal free edge, providing a void having a predetermined shape in said die members adjacent said skirt,

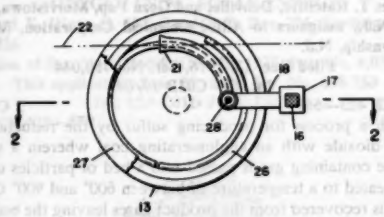
then moving said free edge toward said proximal edge while holding said proximal edge to buckle said intermediate portion into said void, said void being defined in part by a radially and axially inwardly facing tapered surface for engaging the free edge and holding it against movement into said void whereby the shape of the buckled intermediate portion is determined generally by the shape of said void.

4,071,599

TUBULAR MEMBER AND PROCESS OF FORMING A TUBULAR MEMBER

Grant W. Walker, Sacramento, Calif., assignor to Energy Absorption Systems, Inc., Chicago, Ill.

Filed Aug. 20, 1973, Ser. No. 390,171
Int. Cl.[2] B29C 5/04; B29D 3/02
U.S. Cl. 264—311 4 Claims



1. A process of forming a tubular member comprising rotating a tubular form about a central axis, providing the interior surface of said rotating form with a coating of time-setting liquid material, embedding a free-ended strip of reinforcing roving having a length of the order of one-half the diameter of said form into said liquid coating on the interior of said rotating form by an endwise motion of said strip in an approximately chordal direction, continuing rotating said form while said strip is embedded substantially circumferentially in said coating by centrifugal force alone and until said coating is set enough to retain the shape of said form, and then separating the set material and roving embedded therein from said form.

4,071,600

PROCESS FOR IMPROVED 3-WAY EMISSION CONTROL

James C. Schlatter, Troy, and Kathleen C. Taylor, Birmingham, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 6, 1976, Ser. No. 747,806
Int. Cl.[2] B01D 53/34
U.S. Cl. 423—213.7 4 Claims

1. A process for improved three-way stoichiometric type automotive emissions control comprising the steps of contacting the emissions stream with a first catalyst consisting of rhodium supported on a refractory substrate to effect the selective chemical reduction of nitric oxide to nitrogen, said rhodium being present in an amount of at least about 0.002% by weight of the catalyst, said emissions stream being then contacted with a second catalyst separated from said first catalyst and consisting of at least one of the noble metals selected from the group of platinum and palladium, said noble metal being present in a small but effective amount to accomplish the oxidation of the hydrocarbons and carbon monoxide left in said emissions stream, said process being accomplished without the addition of oxygen to said emissions stream.

4,071,601

SELECTIVE REMOVAL OF NITROGEN OXIDES FROM WASTE GASES USING V-MO-W CATALYSTS

Tatsuo Shiraishi; Shinkichi Shimizu, and Tadashi Shindo, all of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 447,377, March 1, 1974, abandoned.
This application Feb. 27, 1976, Ser. No. 662,284
Claims priority, application Japan, Mar. 6, 1973, 48-26759; Sept. 18, 1973, 48-105660
Int. Cl.[2] B01J 8/00; C01B 21/00
U.S. Cl. 423—239 15 Claims

1. A process for the selective removal of nitrogen oxides from waste gases containing 1,500 ppm or less in gas volume of nitrogen oxides, which comprises reducing said nitrogen oxides with ammonia by contacting said waste gases with ammonia in the presence of a complex metal oxide catalyst consisting essentially of vanadium oxide and at least one member selected from the group consisting of molybdenum oxide and tungsten oxide with an atomic ratio of the oxide forming elements of:

$$V_{12-x-y}Mo_xW_y$$

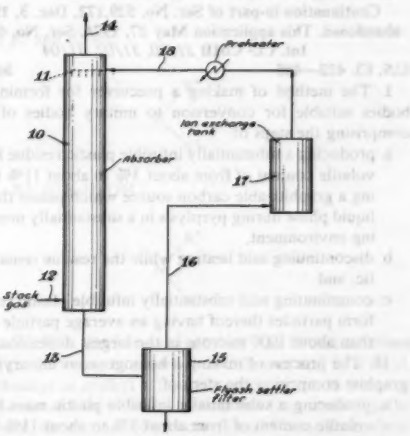
wherein $0 \leqq x \leqq 8$, $0 \leqq y \leqq 5$ and $0.3 \leqq x + y \leqq 8$.

4,071,602

SELECTIVE SEPARATION OF SULFUR OXIDES FROM CARBON DIOXIDE IN AN EFFLUENT GAS STREAM

Roscoe L. Pearce, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 20, 1975, Ser. No. 633,746
Int. Cl.[2] B01D 53/34
U.S. Cl. 423—243 2 Claims



1. In a method for selectively separating sulfur oxides from gas streams containing the same and carbon dioxide by contacting the gas stream with an alkanolamine solution, the improvement which comprises carrying out the contacting of the gas stream with the alkanolamine solution at from about 200° to about 230° F and regenerating the alkanolamine-sulfur oxide containing solution by contacting said solution with a weak base anion exchange resin.

4,071,603
PROCESS FOR PREPARING PHOSPHORIC ACID

Thomas Alan Williams, Beckermet, England, assignor to Albright & Wilson Limited, West Midlands, England

Filed July 28, 1976, Ser. No. 709,388
Claims priority, application United Kingdom, Aug. 1, 1975, 32352/75
Int. Cl.[2] C01B *25/16;* C01F *11/46*
U.S. Cl. 423—320 17 Claims

1. A process for producing wet process phosphoric acid, which comprises the steps of (*a*) contacting phosphate rock with aqueous phosphoric acid and a slurry comprising gypsum, phosphoric acid and sulphuric acid recycled from step (*f*) of the process, to produce a first reaction mixture, (*b*) contacting said first reaction mixture with a hemihydrate containing slurry obtained from step (*e*) of the process to give a second reaction mixture, (*c*) allowing the acids in said second mixture to digest the rock to substantial completion to produce a slurry comprising gypsum, phosphoric acid and sulphuric acid, (*d*) withdrawing a first fraction of said slurry as product which is processed as set forth in step (*g*) and a second fraction which is processed as set forth in step (*e*) and a third fraction comprising the remainder of said slurry, the weight ratio of the first fraction to the second fraction being in the range 1 : 0.75 to 1 : 3, (*e*) adding sulphuric acid to said second fraction of slurry and mixing under conditions of acid concentration, temperature and time such as to convert at least a part of the gypsum in said slurry into calcium sulphate hemihydrate crystals in the slurry, and recycling said slurry containing hemihydrate to step (*b*) of the process, (*f*) recycling said third fraction of the slurry from step (*d*) to step (*a*), and (*g*) filtering the product first fraction of slurry of step (*d*) to yield an aqueous solution of phosphoric acid as filtrate, the total amount of sulphuric acid present in step (*c*) being sufficient to digest the rock.

4,071,604
METHOD OF PRODUCING HOMOGENEOUS CARBON AND GRAPHITE BODIES

Warren C. Schwemer, Arlington, Tex., assignor to Advanced Technology Center, Inc., Grand Prairie, Tex.

Continuation-in-part of Ser. No. 529,172, Dec. 3, 1974, abandoned. This application May 27, 1976, Ser. No. 690,697
Int. Cl.[2] C01B *31/00, 31/02, 31/04*
U.S. Cl. 423—445 34 Claims

1. The method of making a precursor for forming green bodies suitable for conversion to unitary bodies of carbon comprising the steps of:

a. producing a substantially infusible plastic residue having a volatile content of from about 3% to about 11% by heating a graphitizable carbon source which passes through a liquid phase during pyrolysis in a substantially non-oxidizing environment,

b. discontinuing said heating while the residue remains plastic, and

c. comminuting said substantially infusible plastic residue to form particles thereof having an average particle size less than about 1000 microns in the largest dimension.

18. The process of making a homogeneous unitary body of graphite comprising the steps of:

a. producing a substantially infusible plastic mass having a volatile content of from about 3% to about 11% by heating an organic material which passes through a liquid phase during pyrolysis in a non-oxidizing environment,

b. discontinuing said heating while said mass remains plastic,

c. comminuting said substantially infusible plastic mass into particles,

d. pressing said particles into a coherent body, and

e. heating said coherent body to a temperature of at least 1800° C in a non-oxidizing environment and until graphitization has occurred.

4,071,605
PROCESS FOR THE PRODUCTION OF DIBASIC MAGNESIUM HYPOCHLORITE

John A. Wojtowicz, Cheshire, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Jan. 31, 1977, Ser. No. 763,969
Int. Cl.[2] C01B *11/00, 7/02, 11/06;* C01F *5/00*
U.S. Cl. 423—462 12 Claims

1. A process for the production of dibasic magnesium hypochlorite which comprises reacting a solid granular magnesium salt with a solid granular hypochlorite salt selected from the group consisting of alkali metal hypochlorites and calcium hypochlorite wherein at least one of said salts is present as a hydrate to form a reaction mixture, agitating said reaction mixture, and recovering said dibasic magnesium hypochlorite therefrom.

4,071,606
SULFUR DIOXIDE WITH COAL

Charles T. Ratcliffe, Denville, and Geza Pap, Morristown, both of N.J., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Dec. 13, 1976, Ser. No. 750,044
Int. Cl.[2] C01B *17/04*
U.S. Cl. 423—569 2 Claims

1. In a process for producing sulfur by the reduction of sulfur dioxide with an agglomerating coal wherein a sulfur dioxide containing gas is passed into a bed of particles of the coal heated to a temperature of between 600° and 900° C and sulfur is recovered from the product gases leaving the bed, the improvement which comprises reducing the amount of tar in the product gases and reducing the tendency of the coal particles to agglomerate by employing coal particles having a particle size less than 500 microns.

4,071,607
PROCESS FOR PRODUCING SULFUR

Heinz Hiller, Rembrucken, and Herbert Fischer, Lollar, both of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Dec. 7, 1976, Ser. No. 748,219
Claims priority, application Germany, Dec. 8, 1975, 2555096
Int. Cl.[2] C01B *17/04*
U.S. Cl. 423—574 R 7 Claims

1. A process for producing sulfur from an acid gas containing hydrogen sulfide and other sulfur compounds, said process comprising

a. combusting said acid gas partially to produce a process gas stream containing hydrogen sulfide sulfur and sulfur dioxide;

b. catalytically reacting the hydrogen sulfide, with sulfur dioxide in said process gas stream in a Claus process reactor and condensing sulfur from the catalytically reacted stream with a cooling system to produce a further gas stream containing residual sulfurous components;

c. passing said further gas stream at a lower temperature than that of the catalytic reaction of step (b) over an active adsorbent to load said adsorbent with sulfur and produce another gas stream;

d. afterburning the gas stream produced in step (c) which still contains rasidual sulfur and residual H_2S with oxygen to produce a hot exhaust gas stream substantially free from hydrogen sulfide and sulfur and consisting mainly of sulfur dioxide;

e. desorbing the laden adsorbent from step (c)by

e_1. circulating a desorption gas in closed cycle through said laden adsorbent;

e_2. heating said desorption gas before it contacts said laden adsorbent along said closed cycle by passing it in heat exchange with said hot exhaust gas from step (d); and

e_3. condensing sulfur from said desorption gas after it has

contacted said laden adsorbent along said cycle with said cooling system from step (b),

e_4. said cooling system containing water;

f. generating water vapor thereby by said cooling, and

g. condensing said generated water vapor and recycling same by gravity to step (e_3) to condense the sulfur.

4,071,608

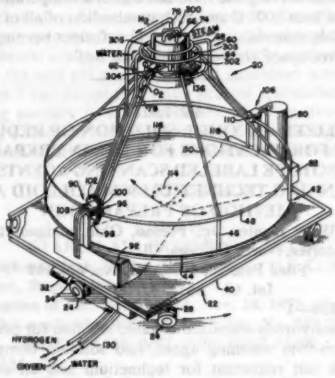
DISSOCIATION OF WATER INTO HYDROGEN AND OXYGEN USING SOLAR ENERGY

Richard E. Diggs, S. 12A Road P.O. Box 776, Carthage, Mo. 64836

Division of Ser. No. 624,409, Oct. 20, 1975, Pat. No. 4,030,890. This application June 22, 1976, Ser. No. 698,753

Int. Cl.² C01B *1/03, 13/02*

U.S. Cl. 423—579 **3 Claims**



1. A process for dissociating hydrogen and oxygen from water, comprising:

providing a body of water in a container;

focusing solar energy onto said body of water container in a manner such that the temperature of the water is raised to the saturation temperature thereof to form steam;

reflecting solar energy from the container;

providing a dissociation container;

separating said steam from said body of water;

moving said steam into said dissociation container;

focusing additional solar energy on said dissociation container, and focusing said reflected solar energy onto said dissociation container so that said additional solar energy and said reflected solar energy cause the temperature of said steam to be raised to the dissociation temperature thereof to dissociate the hydrogen and oxygen contained therein;

separating said hydrogen and oxygen from each other by moving said hydrogen and oxygen along a curved path to subject them to centrifugal forces which cause oxygen to move radially outward and hydrogen to move radially inward; and

removing said separated hydrogen and oxygen from proximity with each other.

4,071,609

METHOD FOR PREPARING PARTICULATE ZINC OXIDE SHAPES OF HIGH SURFACE AREA AND IMPROVED STRENGTH

Victor S. Robinson, Brooklyn Heights, N.Y., assignor to The New Jersey Zinc Company, Bethlehem, Pa.

Filed July 9, 1975, Ser. No. 594,391

Int. Cl.² C01G *9/02*

U.S. Cl. 423—622 **9 Claims**

1. A process for producing high surface area and high crush strength particulate zinc oxide shapes, said process comprising:

a. forming normal zinc oxide having a specific surface area less than 10 square meters per gram into pre-determined shapes without the addition of extraneous binding material;

b. exposing said normal zinc oxide shapes to a carbon dioxide-containing atmosphere including water vapor;

c. converting at least about 45% of said zinc oxide into basic zinc carbonate; and

d. decomposing substantially all of said basic zinc carbonate into particulate zinc oxide shapes.

4,071,610

MANUFACTURE OF GAMMA-IRON(III) OXIDE

Eberhard Koester, Frankenthal; Gerd Wunsch, Speyer; Eduard Schoenafinger, Ludwigshafen, and Hans Henning Schneehage, Mutterstadt, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Apr. 19, 1976, Ser. No. 677,920

Claims priority, application Germany, May 9, 1975, 2520643

Int. Cl.² C01G *49/02*

U.S. Cl. 423—634 **2 Claims**

1. A process for the manufacture of acicular gamma-iron-(III) oxide of high coercive force and giving improved orientation, which comprises the steps of

a. mixing a suspension of non-magnetic, acicular alpha-FeOOH with a solution of a compound of the formula I

(I)

where R^1 and R^2 are

or O—R^5, R^3 is H, OH,

or O—R^5, R^4 is alkyl or cycloalkyl of 1 to 16 carbon atoms and the R^4's may be identical or different, and R^5 is alkyl, cycloalkyl or aralkyl of 3 to 18 carbon atoms, in water or alcohols of 1 to 4 carbon atoms, and then removing the solvent, the amount of said compound I being from about 0.5 to 10 percent by weight based on said non-magnetic iron oxide,

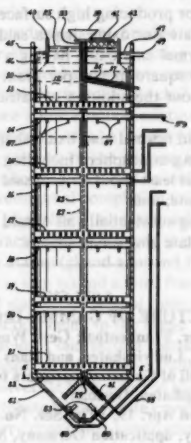
b. reducing the material, obtained according to (a), by means of gases containing hydrogen, at from b 350° to 600° C, to give magnetite, and

c. oxidizing the magnetite, by means of gases containing oxygen, at from 200° to 450° C, to give gamma-iron(III) oxide.

4,071,611
CONTINUOUSLY LEACHING AN ORE COLUMN

Richard E. Chilson, 8350 Tanque Verde Road, Tucson, Ariz. 85715

Division of Ser. No. 612,941, Sept. 12, 1975, abandoned. This application June 24, 1976, Ser. No. 699,385
Int. Cl.[2] B01J 8/12
U.S. Cl. 423—658.5 2 Claims



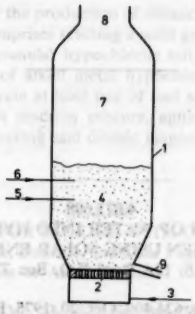
1. A method of continuously leaching ore comprising
a. continuously feeding crushed ore to the top of a column of crushed ore;
b. passing said crushed ore downwardly through a plurality of grids at predetermined spaced intervals along said column of crushed ore to turbulate said ore;
c. continuously airlifting said ore from the bottom of said column through a centrally disposed conduit extending from adjacent the bottom of said column through said column and discharging the airlifted ore laterally from the top of said column;
d. continuously introducing rinsing liquid upwardly into said crushed ore from near the bottom of said column;
e. continuously introducing leaching reagents into said column of crushed ore at said spaced intervals along said column, said solutions mixing with said rinsing liquid to form leaching solutions;
f. continuously sampling said leaching solutions at a plurality of predetermined spaced intervals along said column; and
g. continuously withdrawing said leaching solutions from the top of said column.

4,071,612
PROCESS FOR THE INCINERATION OF CONTAMINATED SALT-BEARING SOLUTIONS

Horst Weyer, Schwerte; Ludwig Muhlhaus, Hennen, and Gerhard Oberschachtsiek, Holzwickede, all of Germany, assignors to Friedrich Uhde GmbH, Dortmund, Germany

Continuation of Ser. No. 514,437, Oct. 15, 1974, abandoned. This application Aug. 27, 1976, Ser. No. 718,170
Int. Cl.[2] C01B 31/20, 5/00
U.S. Cl. 423—659 3 Claims

3. A process for the incineration of fusible salt-bearing aqueous waste effluent in a chemical process containing combustible organic substances in a fluidized bed while avoiding break down of the fluidized bed in an incinerator provided with a free space above the fluidized bed sufficient to provide in the incinerator two distinct burning zones of widely different temperatures, consisting essentially only of
A. injecting into the fluidized bed
1. said effluent
2. fuel and
3. combustion air under pressure upwardly into said bed so as to maintain said bed in a fluidized state;
B. adjusting the quantities of said injections and the fluidized bed material so as to maintain (a) incomplete combustion in the fluidized bed at a temperature at least 100° C below the fusion temperature of the fusible salt or salt mixture in



said effluent and which is also widely different from the temperature attained above the fluidized bed, and (b) substantially complete combustion of the combustible material leaving the fluidized bed at a temperature attaining at least 800° C at which combustion of all of the combustible materials takes place in a distinct burning zone in the free space above the fluidized bed.

4,071,613
STABILIZED ALCOHOL SOLUTION OF REDUCING SALT FORMULATIONS FOR USE IN PREPARING RADIOISOTOPE LABELED SCANNING AGENTS: LIVER SCANNING TECHNETIUM-99M COLLOID AND METHOD OF PREPARATION

William Ward Hunter, Jr., Fresno, Ohio, assignor to Abbott Laboratories, North Chicago, Ill.

Filed Feb. 26, 1976, Ser. No. 661,469
Int. Cl.[2] A61K 43/00, 29/00
U.S. Cl. 424—1 7 Claims

1. An anhydrous stabilized organic solution for preparing a technetium-99m scanning agent, said solution comprising: a metal ion salt reductant for technetium and an anhydrous nonoxidizing organic solvent.

7. A radiolabeled scanning agent comprising a colloid of technetium-99m and the solution of claim 1.

4,071,614
DENTIFRICE CONTAINING ENCAPSULATED FLAVORING

John Edward Grimm, III, New York, N.Y., assignor to Colgate Palmolive Company, New York, N.Y.

Division of Ser. No. 583,380, June 3, 1975, Pat. No. 3,957,964, which is a continuation of Ser. No. 438,028, Jan. 30, 1974, abandoned, which is a continuation of Ser. No. 235,038, March 15, 1972, abandoned. This application Jan. 9, 1976, Ser. No. 647,693
The portion of the term of this patent subsequent to May 18, 1993, has been disclaimed.
Int. Cl.[2] A61K 7/16, 7/28
U.S. Cl. 424—49 19 Claims

1. A dentifrice adapted to release a plural flavor burst comprising a distinctive flavor in thin walled microcapsules producing a distinctive initial flavor during early brushing of the teeth, and a different flavor in a thicker walled microcapsule than said thin walled microcapsule and producing a different flavor subsequent thereto, said flavor in said thin walled capsules being released when said dentifrice is extruded from a

container by shearing contact with the container neck wall and by rupture on contact with the teeth, the flavor in said thicker walled microcapsules being released when latter microcapsules are ruptured during the course of brushing the teeth, said flavors encapsulated in a water insoluble, film forming synthetic organic polymeric plastic having an equivalent diameter of about one micron to 2 millimeters and having a wall thickness of about 0.1 micron to 1.0 millimeter, included in a concentration of about 0.1 to 10% into a dentifrice having a viscosity of under about 40,000 cps.

4,071,615

FLAVORED DENTIFRICE

Jordan B. Barth, East Brunswick, N.J., assignor to Colgate Palmolive Company, New York, N.Y.

Division of Ser. No. 502,043, Aug. 30, 1974, Pat. No. 3,939,261. This application Oct. 16, 1975, Ser. No. 623,180

The portion of the term of this patent subsequent to Feb. 17, 1993, has been disclaimed.

Int. Cl.[2] A61K *7/18*

U.S. Cl. 424—52 **17 Claims**

1. An anhydrous dentifrice which contains about 10 to 90% by weight of a liquid vehicle including a hydroscopic humectant, about 0.1 to 10% by weight of a dipeptide sweetener selected from the group consisting of L-aspartyl-L-phenylalanine methyl and ethyl esters and L-aspartyl-L-hexahydrophenylalanine methyl and ethyl esters in admixture with about 0.1 to 15% by weight of a non-toxic acid anhydride selected from the group consisting of acetic-, succinic-, adipic-, fumaric-, lactic-, malic-, folic-, ascorbic-, aspartic-, benzoic-, isovaleric-, phenoxyacetic-, citric-, tartaric-, orthophosphoric-, lauric- and stearic acid anhydride and compatible mixtures thereof whereby the acid pH integrity of acid sweetener is maintained about 3 to 5 and excess-free water present is absorbed thereby providing stability in said sweetener, said dentifrice further including a fluorine compound in an amount having a beneficial but non-toxic effect on the care and hygiene of the oral cavity.

4,071,616

STARCH AIR FRESHENER GELS

Daniel Richard Bloch, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Continuation of Ser. No. 634,724, Nov. 24, 1975, abandoned. This application Feb. 14, 1977, Ser. No. 768,296

Int. Cl.[2] A61L *9/01, 9/04;* **B01J** *13/00*

U.S. Cl. 424—76 **12 Claims**

1. A slow diffusing air freshener gel composition comprising about 2.5–15% by weight amylose, about 0.25–30% by weight perfume, up to about 5% by weight pigment, and the balance water, said amylose being present in the form of amylose starch having an amylose content of at least 50% by weight amylose, said gel having a gel strength of at least 75 grams.

4,071,617

AQUEOUS FLOWABLE CONCENTRATES OF PARTICULATE WATER-INSOLUBLE PESTICIDES

Thomas M. Graves, Richmond, and Theodore H. Koundakjian, Albany, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 206,516, Dec. 9, 1971, abandoned, which is a continuation of Ser. No. 829,769, June 2, 1969, abandoned. This application Feb. 9, 1976, Ser. No. 656,231

Int. Cl.[2] A61K *31/765, 31/40, 31/39;* **A01N** *9/00*

U.S. Cl. 424—78 **11 Claims**

1. A flowable, viscous, aqueous pesticidal concentrate which is compatible with other pesticides on dilution with water consisting essentially of water, 10 to 80% by weight based on the water, of a solid water-insoluble particulate pesticide having a particle size less than 20 microns and a vinyl alcohol/vinyl acetate polymer having about 5 to 15 mols of vinyl acetate per 100 mols of copolymer and a viscosity of 30 to 60 centipoises as measured in a 5% aqueous solution using a Brookfield viscometer with a number 1 spindle at 30 rpm at 20° C, the weight ratio of pesticide to copolymer being in the range of 1:1 and 1000:1.

4,071,618

PROCESS FOR PREPARING VIRUS DISEASE LIVE VACCINES

Takeo Konobe; Tetsuo Onoda, and Koichi Ono, all of Kanonji, Japan, assignors to Research Foundation for Microbial Diseases of Osaka University, Osaka, Japan

Continuation of Ser. No. 502,633, Sept. 3, 1974, abandoned, which is a continuation of Ser. No. 309,692, Nov. 27, 1972, abandoned, which is a continuation of Ser. No. 313,539, April 5, 1971, abandoned. This application July 6, 1976, Ser. No. 702,398

Int. Cl.[2] A61K *39/12;* **C12B** *3/00;* **C12K** *9/00*

U.S. Cl. 424—89 **10 Claims**

1. In a process for the production of a live virus vaccine by the tissue culture method comprising the adaptation, attenuation and propagation of a virus selected from the group consisting of rubella, mumps, influenza A, influenza B, distemper, Newcastle disease, Japanese encephalitis, dengue fever, rabies, and turkey Herpes viruses, the improvement comprising

a. incubating the virus in a culture of a quail embryonated egg or tissue culture of a quail embryo fibroblast, and

b. subjecting the virus to successive cultivation in a culture medium for a sufficient number of passages to propagate the virus, at least one passage in the successive cultivation being effected in a culture medium containing a quail embryonated egg or a quail embryo fibroblast.

4,071,619

METHOD OF PRODUCING VACCINES

Tamaz Vladimirovich Peradze, ulitsa Basseinaya, 53, kv. 353; Eidlya Abramovna Fridman, ulitsa Rudischeva, 19, kv. 2; Nina Vsevolodovna Zheleznova, ulitsa Khalturina, 13, kv.; Vsevolod Mikhailovich Kolikov, prospekt Engelsa, 100, kv. 59; Semen Khaimovich-Efimovich Bresler, Lesnoi prospekt, 61, kv. 244; Boris Viktorovich Mchedlishvili, Novoizmailousky prospekt, 3, kv. 211; Viktor Mikhailovich Molodkin; Ljudmila Mikhailovna Molodkina, both of prospekt Shaumiana, 2, kv. 11, and Nina Vasilievna Katushkina, Novoizmailovsky prospekt, 4, kv. 245, all of Leningrad, U.S.S.R.

Continuation of Ser. No. 523,363, Nov. 13, 1974, abandoned. This application Sept. 2, 1976, Ser. No. 719,692

Claims priority, application U.S.S.R., Nov. 16, 1973, 1967101

Int. Cl.[2] A61K *41/00, 39/12;* **C12K** *7/00*

U.S. Cl. 424—90 **8 Claims**

1. A method for producing vaccines comprising purification of a viral culture by gel chromatography in columns packed with a porous silicate virion non-absorbing material having pore diameter of 50 to 10,000A, concentration by adsorption in columns packed with a porous silicate sorbent having a pore diameter of 50 to 10,000A and a porosity of 0.3 to 2.5 cm^3/g, followed by virus desorption by means of buffer solutions having a pH of 6 to 10 in two steps using a gradient of ionic strength of from 0.1 to 1.0:

a. at the beginning of the gradient, the columns are washed to eliminate the initial culture remaining between the sorbent granules, and

b. at the end of the gradient, virions are desorbed, with subsequent transfer of the viral suspension into physiological conditions of pH 7 to 7.8 with NaCl concentration of 0.14–0.15 mole/1 and inactivation of the viral suspension.

4,071,620

STABILIZATION OF OXYGEN SENSITIVE DOSE FORMS

Stanley Sklar, Broomall, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Jan. 10, 1977, Ser. No. 758,236
Int. Cl.[2] A61K *31/00, 31/54*
U.S. Cl. 424—175 10 Claims

1. A therapeutic composition of matter containing up to 50 milligrams per cubic centimeter of an active ingredient selected from the group consisting of promethazine and its pharmaceutically acceptable acid addition salts in a pharmaceutical carrier stabilized with at least 2 milligrams per cubic centimeter of monothioglycerol.

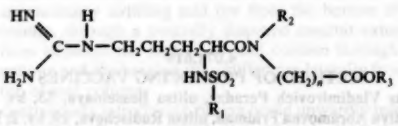
4,071,621

N^2-ALKOXYNAPHTHALENESULFONYL-L-ARGININAMIDES AND THE PHARMACEUTICALLY ACCEPTABLE SALTS THEREOF

Shosuke Okamoto; Akiko Hijikata, both of Kobe; Ryoji Kikumoto, Machida; Yoshikuno Tamao, Yokohama; Kazuo Ohkubo, Machida; Tohru Tezuka, Yokohama, and Shinji Tonomura, Tokyo, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo and Shosuke Okamoto, both of, Japan

Continuation-in-part of Ser. No. 649,219, Jan. 14, 1976, Pat. No. 4,018,913. This application Jan. 19, 1977, Ser. No. 760,726
The portion of the term of this patent subsequent to Apr. 19, 1994, has been disclaimed.
Int. Cl.[2] A61K *37/00;* C07C *103/52*
U.S. Cl. 424—177 5 Claims

1. N^2-alkoxynaphthalenesulfonyl-L-argininamides having the formula:



and the pharmaceutically acceptable salts thereof, wherein R_1 is naphthyl substituted with at least one C_1–C_5 alkoxy; R_2 is C_2–C_{10} alkylthioalkyl; R_c is C_1–C_{10} alkyl, C_6–C_{10} aryl or C_7–C_{12} aralkyl; and n is an integer of 1, 2 or 3.

4,071,622

TREATMENT OF A MAMMARY OR DMBA INDUCIBLE TUMOR

Edwin Samuel Johnson, Antioch, and John Hunter Seely, Lake Forest, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Feb. 11, 1976, Ser. No. 657,344
Int. Cl.[2] A61K *37/02*
U.S. Cl. 424—177 9 Claims

1. The method of reducing the size of a mammary or DMBA-inducible tumor in a warm-blooded animal by administering to an animal having a mammary or DMBA-inducible tumor an effective daily amount to reduce the size of such a tumor of a nonapeptide of the formula

L-pGlu-L-His-L-Trp-L-Ser-L-Tyr-X-L-Leu-L-Arg-L-Pro-NH-C_2H_5

wherein X denotes the optically active D-form of Tyr, Trp or Phe.

4,071,623

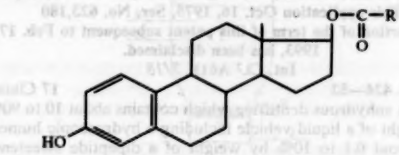
PHARMACEUTICAL PREPARATION ADAPTED FOR ORAL ADMINISTRATION

Johannes van der Vies, Oss, Netherlands, assignor to Akzona Incorporated, Asheville, N.C.

Filed May 17, 1976, Ser. No. 687,267
Claims priority, application Netherlands, May 30, 1975, 7506407
Int. Cl.[2] C07J *1/00;* A61K *31/56*
U.S. Cl. 424—238 32 Claims

1. A pharmaceutical preparation with oestrogenic activity adapted for oral administration comprising

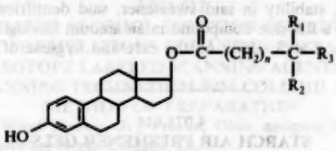
an oestrogenically effective amount when orally administered of at least one 17β-ester of oestradiol having the formula



the ester group thereof being derived from an aliphatic carboxylic acid having 9 to 16 carbon atoms, and

a pharmaceutically acceptable non-steroid lipoid carrier, wherein said 17-β ester of oestradiol constitutes from 0.01 to 50% by weight of said preparation and said non-steroid lipoid carrier is present in an amont of at least equal to the amount of said 17β-ester of oestradiol.

11. A 17β-ester of oestradiol having the formula:



wherein

n = 0, 1 or 2;

R_1 = alkyl having 1–10 carbon atoms;

R_2 = H or alkyl having 1–10 carbon atoms;

R_3 = an aliphatic group having 1–18 carbon atoms, which group may contain a ring having 5–12 carbon atoms;

or R_1 and R_3 form together with the carbon atom to which they are attached and a cycloaliphatic group having 7–12 carbon atoms, said cycloaliphatic group optionally being substituted by an aliphatic group having 1–6 carbon atoms, with the proviso that the total number of carbon atoms in the ester group is in the range of 8–20 carbon atoms.

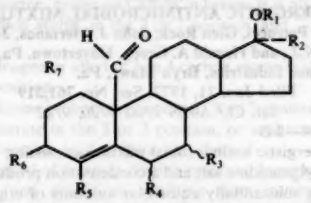
4,071,624

ANDROST-4-EN-19-ONES FOR THE ENHANCEMENT OF LIBIDO

Joyce F. Grunwell, Hamilton, Ohio, and Vladimir Petrow, Chapel Hill, N.C., assignors to Richardson-Merrell Inc., Wilton, Conn.

Continuation-in-part of Ser. No. 469,480, May 13, 1974. This application Feb. 7, 1977, Ser. No. 766,236
Int. Cl.[2] A61K *31/56;* C07J *1/00*
U.S. Cl. 424—238 4 Claims

1. A method of enhancing the libido of mammals in need thereof which comprises the administration to such mammal of a therapeutically effective amount of an androst-4-en-19-one having the formula



wherein

R_1 and R_8 are each selected from the group consisting of hydrogen, acyl having from 1 to 12 carbon atoms, lower alkyl having from 1 to 3 carbon atoms, trialkylsilyl in which the alkyl group has from 1 to 5 carbon atoms, triphenylsilyl, 2-tetrahydropyranyl, 4-tetrahydropyranyl, 1-cycloalkenyl having from 5 to 7 carbon atoms, 1-methoxycycloalkyl and 1-ethoxycycloalkyl in which the cycloalkyl group has from 5 to 7 carbon atoms,

R_2 is selected from the group consisting of hydrogen, lower alkyl having from 1 to 6 carbon atoms, lower alkenyl having from 2 to 6 carbon atoms, lower alkynyl having from 2 to 6 carbon atoms and when R_2 and OR_1 are taken together is oxo,

R_3, R_4, R_5 and R_7 are hydrogen and methyl, and

R_6 is selected from the group consisting of H_2, oxo and $H(OR_8)$.

4,071,625

19-OXYGENATED-5α-ANDROSTANES FOR THE ENHANCEMENT OF LIBIDO

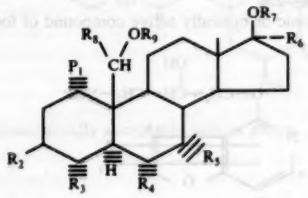
Joyce F. Grunwell, Hamilton, Ohio, and Vladimir Petrow, Chapel Hill, N.C., assignors to Richardson-Merrell Inc., Wilton, Conn.

Continuation-in-part of Ser. No. 469,478, May 13, 1974. This application Feb. 7, 1977, Ser. No. 766,237

Int. Cl.[2] A61K *31/56;* **C07J** *1/00*

U.S. Cl. 424—238 **4 Claims**

1. A method of enhancing the libido of mammals in need thereof which comprises the administration to such mammals of a therapeutically effective amount of a 19-oxygenated-5α-androstane having the formula



wherein

R_1, R_3, R_4 and R_5 are hydrogen and methyl,

R_2 is selected from the group consisting of H_2, oxo and $H(OR_{10})$,

R_6 is selected from the group consisting of hydrogen, lower alkyl having from 1 to 6 carbon atoms, lower alkenyl having from 2 to 6 carbon atoms, lower alkynyl having from 2 to 6 carbon atoms and when taken together with OR_7 is oxo,

R_7, R_9 and R_{10} are each selected from the group consisting of hydrogen, acyl having from 1 to 12 carbon atoms and an ether selected from the group consisting of lower alkyl having from 1 to 3 carbon atoms, trialkylsilyl in which the alkyl group has from 1 to 5 carbon atoms, triphenylsilyl, 2-tetrahydropyranyl, 4-tetrahydropyranyl, 1-cycloalkenyl having from 5 to 7 carbon atoms, 1-methoxycycloalkyl and 1-ethoxycycloalkyl in which the cycloalkyl group has from 5 to 7 carbon atoms,

R_8 is hydrogen and when taken together with OR_9 is oxo.

4,071,626

7α-HALOGENO-3,20-DIOXO-1,4-PREGNADIENES, METHODS FOR THEIR MANUFACTURE, THEIR USE AS ANTI-INFLAMMATORY AGENTS, AND PHARMACEUTICAL FORMULATIONS USEFUL THEREFOR

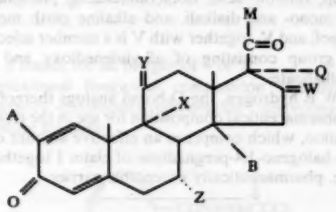
Michael J. Green, Kendall Park, and Ho-Jane Shue, Belleville, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Dec. 22, 1976, Ser. No. 753,256

Int. Cl.[2] A61K *31/58, 31/56*

U.S. Cl. 424—241 **27 Claims**

1. A 3,20-dioxo-7-halogeno-1,4-pregnadiene of the following formula:



wherein A is hydrogen, and provided Y is (H,βOH), chlorine, fluorine or methyl;

B is hydrogen or, together with Q, is a 14α,17α-alkylidenedioxy derivative;

X is a member selected from the group consisting of hydrogen and halogen having an atomic weight less than 100;

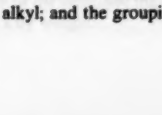
Y is a member selected from the group consisting of (H,H) provided X is hydrogen, oxygen, (H,βOH), (H,βOCOH); and (H,β-halogen) provided X is chlorine or bromine, said β-halogen having an atomic weight of less than 100 and being at least as electronegative as X;

Z is fluorine, chlorine, bromine and, provided X is hydrogen, iodine;

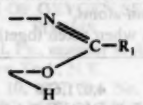
Q is a member selected from the group consisting of hydrogen provided W is a member selected from the group consisting of (H,H) and (H, lower alkyl); chlorine; bromine; and OV wherein V is a member selected from the group consisting of hydrogen and an acyl radical of a hydrocarboncarboxylic acid having up to 12 carbon atoms or of benzoic acid substituted by a halogen or methoxy group;

W is a member selected from the group consisting of (H,H); (H, lower alkyl); (H,α-OV_1) wherein V_1 is a member selected from the group consisting of hydrogen and an acyl radical of an acid selected from the group consisting of a hydrocarboncarboxylic acid having up to 12 carbon atoms, benzoic acid substituted by a halogen or methoxy group, retinoic acid, and isonicotinic acid; =CHT wherein T is a member selected from the group consisting of hydrogen, lower alkyl, fluorine and chlorine, and

W and Q taken together is a member selected from the group consisting of 16α,17α-lower alkylidenedioxy; 16α,17α-cycloalkylidenedioxy; the grouping



wherein R is lower alkyl; and the grouping



wherein R_1 is lower alkyl or phenyl;

M is a member selected from the group consisting of $—OR_2$ when Q is O-acyl, R_2 being lower alkyl or halogeno lower alkyl; —CHO, acetals, hemiacetals and acylals thereof; $—COOR_3$ wherein R_3 is an alkyl having up to 12 carbon atoms; $—CH_2G$ wherein G is a member selected from the group consisting of hydrogen, halogen having an atomic weight of less than 100, OV_2 wherein V_2 is a member selected from the group consisting of hydrogen and an acyl radical of an acid selected from the group consisting of a hydrocarboncarboxylic acid having up to 12 carbon atoms, benzoic acid substituted by a halogen or methoxy group, retinoic acid, isonicotinic acid, phosphoric acid and mono- and dialkali, and alkaline earth metals salts thereof; and V_2 together with V is a member selected from the group consisting of alkylidenedioxy and alkylorthoalkanoate;

when W is hydrogen, the D-homo analogs thereof.

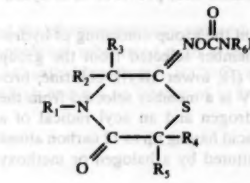
19. A pharmaceutical composition for use in the treatment of inflammation, which comprises an effective amount of a 3,20-dioxo-7α-halogeno-1,4-pregnadiene of claim 1 together with a non-toxic, pharmaceutically acceptable carrier.

4,071,627
2-OXIMINO-TETRAHYDRO-1,4-THIAZIN-5-ONE COMPOUNDS AND PESTICIDAL CARBAMATE DERIVATIVES

John Apling Durden, Jr., South Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed Sept. 29, 1976, Ser. No. 727,634
Int. Cl.² C07D *279/12;* A01N *9/12*
U.S. Cl. 424—246 **46 Claims**

32. A method of controlling insects and mites which comprises subjecting them to an insecticidally or miticidally effective amount of a compound of the formula:



wherein:

R_1, R_2, R_3, R_4 and R_5 are individually hydrogen or alkyl;

R_6 and R_7 are individually hydrogen, alkenyl, alkynyl, phenylalkyl or either substituted or unsubstituted alkyl or phenyl wherein the permissible substituents are one or more fluoro, chloro, bromo, nitro, cyano, alkyl, alkoxy, alkylthio, alkylsulfinyl, alkylsulfonyl, carbamoyl, alkylcarbamoyl, or dialkylcarbamoyl substituents in any combination ; or when R_6 is other than hydrogen R_7 may also be alkanoyl, trihalomethanesulfenyl, dialkylaminosulfenyl, morpholinosulfenyl, pyrrolidylsulfenyl, piperidylsulfenyl, or either substituted or unsubstituted phenylsulfenyl wherein the permissible substituents are one or more fluoro, chloro, bromo, nitro, cyano, alkoxy, alkyl trihalomethyl, alkylthio, alkylsulfinyl or alkylsulfonyl substituents in any combination; with the proviso that R_1, R_2, R_3R_4 and R_5 substituents individually may not include more than eight aliphatic carbon atoms and R_6 and R_7 substituents individually may not include more than eighteen carbon atoms.

4,071,628
SYNERGISTIC ANTIMICROBIAL MIXTURES

Alfonso N. Petrocci, Glen Rock; John J. Merianos, Jersey City, both of N.J., and Harold A. Green, Havertown, Pa., assignors to Kewanee Industries, Bryn Mawr, Pa.

Filed Jan. 21, 1977, Ser. No. 761,319
Int. Cl.² A01N *9/00, 9/20, 9/22*
U.S. Cl. 424—249 **8 Claims**

1. A synergistic antimicrobial mixture consisting essentially of a dodecylguanidine salt and a condensation product formed by reacting substantially equimolar amounts of ethanolamine and formaldehyde at the reflux temperature of the reaction mixture until the stoichiometric amount of water is formed, said condensation product being present in the mixture in a ratio of about 1:1 to about 15:1 by weight relative to said dodecylguanidine salt.

4,071,629
NOVEL PHARMACEUTICAL COMPOSITIONS AND METHOD FOR TREATING PSYCHASTHENIA

Jacques Servier, Neuilly-sur-Seine, France, assignor to Science Union et Cie, Societe Francaise de Recherche Medicale, Suresnes, France

Filed Aug. 27, 1976, Ser. No. 718,134
Int. Cl.² A61K *31/505*
U.S. Cl. 424—251 **2 Claims**

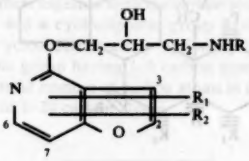
1. A method for treating depressive state in a human subject, and resulting psychic weakness and behavioural disturbance, which consists in administering parenterally, orally, sublingually, or rectally to said subject an amount of bis [(isobutyryloxyethyl) methylene] bis N-[(4-amino 2-methyl 5-pydimidinyl) methyl] formamide disulphide which is effective for said purpose.

4,071,630
1-SUBSTITUTED-AMINO-3-(4-FURO[3,2-c]PYRIDINYLOXY)-2-PROPANOLS

Erik Wiskott, and Franz Troxler, both of Bottmingen, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 605,972, Aug. 20, 1975, Pat. No. 3,998,835. This application Oct. 18, 1976, Ser. No. 733,565
Claims priority, application Switzerland, Apr. 8, 1975, 4432/75
Int. Cl.² A61K *31/44;* C07D *405/04*
U.S. Cl. 424—256 **14 Claims**

1. A racemic or optically active compound of formula I,



I

wherein

R is alkyl of 3 to 7 carbon atoms or cycloalkyl of 3 to 7 carbon atoms, cycloalkyl of 3 to 7 carbon atoms monosubstituted by alkyl of 1 to 4 carbon atoms, α-dialkylpropynyl of 5 to 9 carbon atoms or α-dialkyl-allyl of 5 to 9 carbon atoms, hydroxyalkyl of 2 to 7 carbon atoms or phenoxyalkyl of 8 to 11 carbon atoms, the oxygen atom of the last two radicals being separated by at least two carbon atoms from the nitrogen atom to which R is bound,

R_1 is

i. hydrogen or alkyl of 1 to 4 carbon atoms, in the 2,3,6 or 7 position, or

ii. chlorine or bromine, in the 2, 3 or 7 position,

iii. nitro or-NHA wherein A is alkanoyl of 1 to 4 carbon atoms, in the 2, 3 or 7 position, or

iv. fluorine, cyano or COOB, wherein B is alkyl of 1 to 4 carbon atoms, in the 2 or 3 position, and

R_2 is

i. hydrogen or alkyl of 1 to 4 carbon atoms in the 2, 3, 6 or 7 position,

ii. chlorine or bromine, in the 2, 3 or 7 position, or

iii. fluorine in the 2 or 3 position, or a pharmaceutically acceptable acid addition salt thereof.

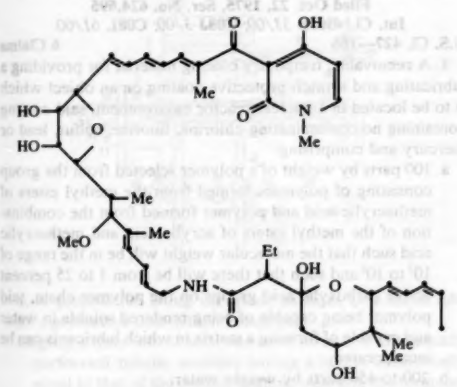
2. A method of treating Angina pectoris, hyperkinetic heart syndrome and conditions resulting from muscular hypertrophic subvalvular aortic stenosis in animals which comprises administering to an anima in need of such treatment a therapeutically effective amount of a compound of claim 1.

4,071,631
ANTIBIOTIC A21A

Sheldon B. Zimmerman, Springfield, N.J., and John H. Chalmers, Jr., Houston, Tex., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 29, 1976, Ser. No. 736,794
Int. Cl.² C07D *405/14*
U.S. Cl. 424—263 **3 Claims**

1. A compound having the following structure:



or its pharmaceutically acceptable salts or esters.

4,071,632
METHOD OF ALLEVIATING HYPERTENSION

James L. Butterfield, New Berlin, and George C. Wright, Norwich, both of N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Dec. 30, 1976, Ser. No. 755,457
Int. Cl.² A61K *31/44*
U.S. Cl. 424—263 **1 Claim**

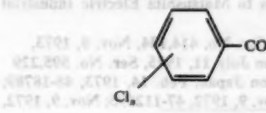
1. A method for alleviating hypertension which comprises administering to a hypertensive host an antihypertensive amount of 3-amino-2-hydrazinopyridine hydrochloride in acceptable pharmaceutical dosage form.

4,071,633
FUNGICIDAL N-TRICHLOROACETYL-N'-CHLOROBENZOYLHYDRAZINE DERIVATIVES

Katsumichi Aoki; Susumu Shimizu; Keigo Satake; Shiro Yamazaki, and Nobuo Hatakeyama, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

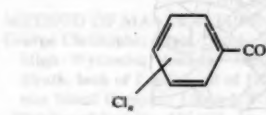
Filed Feb. 25, 1977, Ser. No. 772,131
Claims priority, application Japan, Mar. 2, 1976, 51-22811
Int. Cl.² A01N *9/20*; C07C *103/82*
U.S. Cl. 424—324 **7 Claims**

1. N-trichloroacetyl-N'-chlorobenzoylhydrazine derivative having the following formula:



where *n* stands for an integer of 1 or 2.

4. Agricultural fungicidal composition including N-trichloroacetyl-N'-chlorobenzoylhydrazine derivative having the following formula:



where *n* stands for an integer of 1 or 2; in a fungicidally effective amount, with a suitable carrier.

4,071,634
PROTEINACEOUS LOW FAT SPREAD

Inga Elna Maria Wilton, Stockholm; Lennart Olof Gunnemar Envall, Lidingoe; Kurt Lage Sundstroem, Helsingborg, all of Sweden, and David Patrick Joseph Moran, Potters Bar, England, assignors to Lever Brothers Company, New York, N.Y.

Filed Nov. 2, 1976, Ser. No. 737,926
Claims priority, application United Kingdom, Nov. 7, 1975, 46214/75
Int. Cl.² A23D *3/00, 3/02*
U.S. Cl. 426—604 **6 Claims**

1. A low fat spread having a total fat content of 30 to 50% by weight comprising a continuous fatty phase containing a fat blend which is plastic at room temperature and a dispersed proteinaceous aqueous phase containing 0.01–2% of phosphatides, 2–8% of proteinaceous ingredients and 1–30% of dispersed fat, calculated on the weight of the low fat spread, the weight ratio of continuous to dispersed fat being from 1:1 to 40:1.

4,071,635
MIXES AND PROCESSES FOR PREPARING MEAT PRODUCTS

Willibald M. Lindl, Minneapolis; James R. Klande, Crystal, and Glenn J. VanHulle, Brooklyn Park, all of Minn., assignors to General Mills, Inc., Minneapolis, Minn.

Filed Jan. 12, 1976, Ser. No. 647,942
Int. Cl.² A23L *1/31*
U.S. Cl. 426—264 **18 Claims**

1. A dry mix composition for use in the preparation of cooked meat products of the nature of lunchmeat specialties consisting essentially of the identified ingredients in the following approximate %'s by weight:

	%
(1) Starch or starch source material	25 to 85
(2) Protein component	1.5 to 55
(3) Meat curing agent	0.10 to 3.0
(4) Alkaline phosphate salt	0.10 to 15.0
(5) Sodium Chloride	1.0 to 25.0

wherein the protein component (2) is made up of egg albumin and a second protein in the weight ratio range of 48:1 to 1:48.

4,071,636

METHOD OF PRODUCING SHEET-FORMED BACTERICIDAL ARTICLE

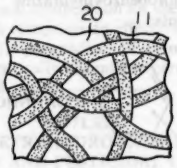
Atsushi Nishino; Kazunori Sonetake, and Hiroshi Kumano, all of Kadoma, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Continuation-in-part of Ser. No. 414,134, Nov. 8, 1973, abandoned. This application July 11, 1975, Ser. No. 595,229

Claims priority, application Japan, Feb. 14, 1973, 48-18789; Nov. 9, 1972, 47-112698; Nov. 9, 1972, 47-112695; Nov. 9, 1972, 47-112691

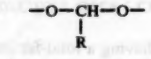
Int. Cl.² B01D *39/08*

U.S. Cl. 427—2 **6 Claims**



1. A method of producing a sheet-formed bactericidal article for the sterilization of dechlorinated potable water in a water purifier, the article consisting of a cloth substrate and fine particles of silver chloride firmly deposited on the surfaces of the fiber filaments of the cloth substrate, the method comprising the steps of;

soaking a non-woven cloth sheet of partially acetal-formed polyvinyl alcohol in an aqueous solution of silver nitrate in the concentration range from 1 to 20% by weight, the hydroxyl radicals in said partially acetal-formed polyvinyl alcohol having been subjected to partial condensation with an aldehyde to form acetal radicals



such that the extent of the acetal formation is less than 50 mol% of polyvinyl alcohol;

drying the soaked sheet to remove water; and

soaking the dried sheet in an aqueous solution of sodium chloride in the concentration range from 1 to 20% by weight to convert said silver nitrate adhering to said sheet into silver chloride.

4,071,637

PROCESS FOR PUNCHING HOLES AND SLOTS IN STRUCTURAL TIMBER

Wolfhart Dittrich; Helmut Heuer; W. F. G. Kamm; Thorwald Kipp; Gerhard Lühr, and Erich Poggemeier, all of Bad Oeynhausen, Germany, assignors to Eisenwerk Weserhutte AG, Germany

Division of Ser. No. 666,576, March 15, 1976, abandoned. This application Dec. 28, 1976, Ser. No. 754,930

Int. Cl.² B05D *3/02, 1/18*

U.S. Cl. 427—12 **1 Claim**

1. A process for introducing holes or straight or circular slots approximately normal to the surface of a cut timber to an approximately predetermined depth, comprising directing at least one arc erosion beam of high energy or high energy density at the sites of said holes or slots to destroy the timber material at said sites corresponding to the desired hole diameters or slot widths.

4,071,638

METHOD OF APPLYING A METALLIC COATING WITH IMPROVED RESISTANCE TO HIGH TEMPERATURE TO ENVIRONMENTAL CONDITIONS

David R. Chang, Cincinnati, and John J. Grisik, Middletown, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Division of Ser. No. 521,860, Nov. 7, 1974, Pat. No. 3,951,642. This application Oct. 9, 1975, Ser. No. 621,081

Int. Cl.² B05D *1/34, 7/14;* B32B *15/20*

U.S. Cl. 427—192 **8 Claims**

1. In a method of applying an oxidation and sulfidation resistant metallic coating to a metal article, the step of applying both Hf and Al so that Hf comprises 0.1 - 10 weight percent of the coating.

4,071,639

COATING MATERIAL AND METHOD

David Nelson Palmer, Tolland, and Stanley Heikoff, South Windsor, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Oct. 22, 1975, Ser. No. 624,695

Int. Cl.² B65B *33/00;* C08J *3/00;* C08L *61/00*

U.S. Cl. 427—156 **6 Claims**

1. A removable, temporary coating material for providing a lubricating and scratch protective coating on an object which is to be located in a nuclear reactor environment, said coating containing no contaminating chlorine, fluorine, sulfur, lead or mercury and comprising:

a. 100 parts by weight of a polymer selected from the group consisting of polymers formed from the methyl esters of methacrylic acid and polymer formed from the combination of the methyl esters of acrylic acid and methacrylic acid such that the molecular weight will be in the range of 10^3 to 10^6 and such that there will be from 1 to 25 percent active carboxylic acid groups on the polymer chain, said polymer being capable of being rendered soluble in water and capable of forming a matrix in which lubricants can be incorporated;

b. 200 to 450 parts by weight water;

c. 0.75 to 3.0 parts by weight of a surfactant;

d. 1.00 to 4.00 parts by weight of glycerin;

e. 0.50 to 1.50 parts by weight of a lubricant selected from the group consisting of polyvinyl silicone and polyphenyl silicone, and;

f. 10 to 30 parts by weight of a reactive solubilizing agent which will render said polymer soluble in water.

4,071,640

PENETRATION PHOSPHORS FOR DISPLAY DEVICES

Stanley F. Ignasiak, Holliston, Mass., assignor to Sperry Rand Corporation, New York, N.Y.

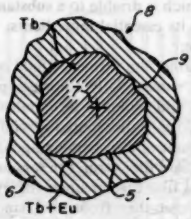
Filed Mar. 22, 1976, Ser. No. 669,426

Int. Cl.² C09K *11/14, 11/46*

U.S. Cl. 427—215 **14 Claims**

1. A method for making a cathodo-luminescent particle having a central region consisting of La_2O_2S with Tb_2O_2S uniformly distributed therethrough and a peripheral region of $La_2O_2SO_4$ with a distribution of $Tb_2O_2SO_4$ therethrough comprising:

selecting a host material consisting of La_2O_2S particles with a uniform distribution of Tb_2O_2S therethrough,



annealing said host material with oxygen for at least 25 minutes at a temperature in excess of 700° C, and air cooling said material.

4,071,641

METHOD FOR PROTECTIVE COATING THE INSIDE OF SURFACES OF METAL TUBES BY VAPOR DEPOSITION

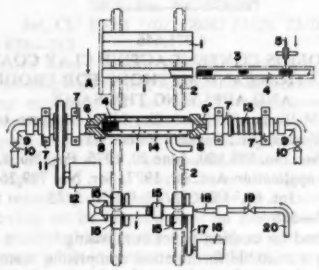
Sadao Susai, Higashi, Osaka, Japan, assignor to Daiwa Kogyo Co., Ltd., Osaka, Japan

Filed July 7, 1976, Ser. No. 703,150

Claims priority, application Japan, Sept. 3, 1975, 50-107388; July 4, 1975, 50-82914

Int. Cl.² B05D 1/00

U.S. Cl. 427—234 16 Claims



1. A process for lining the inside surfaces of a metal tube with a protective coat which comprises:

shaping a resin into at least one solid form of a substantially perforated tubular member having a length substantially equal to that of the desired coating, inserting the form into said metal tube, forming a vacuum within said tube, rotating said tube at a first speed while heating it, whereby said resin forms a lining inside said tube, and cooling said tube and said resin.

4,071,642

METHOD OF REINFORCING POROUS MATERIALS

Katsuhiko Oka, Osaka, Japan, assignor to Asahi Fancy Plywood Co., Ltd., Osaka, Japan

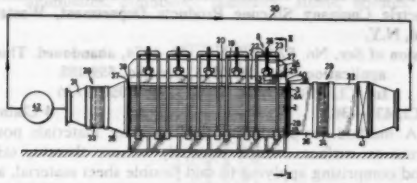
Filed July 23, 1976, Ser. No. 707,940

Claims priority, application Japan, Aug. 1, 1975, 50-94474

Int. Cl.² B05D 3/02, 7/00; C23C 13/00

U.S. Cl. 427—243 8 Claims

1. A method of reinforcing a porous material comprising coating a desired surface of a porous material having a specific gravity of 0.2 to 1.0 with 2 to 50% by weight of a polymerizable substance based on the weight of the porous material, placing the coated porous material into a container having a capacity approximately equal to the volume of the coated material, hermetically sealing the container, and without the application of pressure heating the closed container to diffuse at least part of the polymerizable substance through the porous



material upon vaporization and to subsequently polymerize the polymerizable substance.

4,071,643

METHOD OF MANUFACTURING BEARING MATERIAL

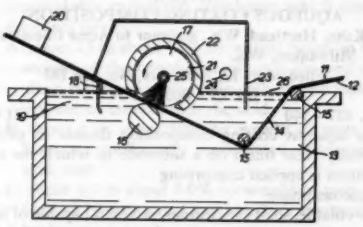
George Christopher Pratt, Chorleywood; Barry John Eastwood, High Wycombe; Anthony Dennis Michael, and Leonard Heath, both of London, all of England, assignors to The Glacier Metal Company Limited, Wembly, England

Division of Ser. No. 435,933, Jan. 23, 1974, abandoned. This application Nov. 20, 1975, Ser. No. 633,695

Claims priority, application United Kingdom, Jan. 24, 1973, 3551/73

Int. Cl.² C23C 1/06

U.S. Cl. 427—292 2 Claims



1. A method of manufacturing a plain bearing, which comprises

bonding an aluminum or aluminum alloy interlayer to a continuous steel backing strip;

passing the resulting composite strip below the surface of a bath of molten lead/tin alloy coating material;

holding the composite strip under the surface of the bath of coating material until its temperature is substantially equal to that of the bath of coating material;

removing oxide from the surface of the interlayer, during its stay in the bath, and coating the resulting cleaned surface with said coating material;

withdrawing the coated composite strip from the bath over means retaining the strip straight across its width; casting a lead/tin alloy overlay onto the coated surface of the interlayer; and

forming the coated composite strip material with its overlay into a semi-cylindrical bearing shell without removing metal in a machining operation.

4,071,644

METHOD FOR RENDERING FLEXIBLE SHEET MATERIAL NON-ADHERENT

Maurice E. Grenoble, Ballston Lake, N.Y., assignor to General Electric Company Silicone Products Department, Wasterford, N.Y.

Division of Ser. No. 523,898, Nov. 14, 1974, abandoned. This application Mar. 18, 1975, Ser. No. 559,488

Int. Cl.[2] B05D *7/04, 5/08, 3/10;* B05P *1/36*

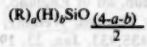
U.S. Cl. 427—302 4 Claims

1. A method for rendering flexible sheet materials non-adherent to surfaces which normally adhere thereto, said method comprising applying to said flexible sheet material, an amount of a solventless composition that will render said flexible sheet material non-adherent to surfaces which normally adhere thereto, said solventless composition comprising:

a. from 5–20 parts by weight of a silanol chainstopped polysiloxane having the formula:

wherein R is a monovalent hydrocarbon radical, a halogenated monovalent hydrocarbon radical or a cyanoalkyl radical and *t* has a value which will give a viscosity between 300 and 1,000 cstks. at 25° C;

b. from 0.1 to 5 parts by weight of an organic hydrogenpolysiloxane of the formula:



wherein R is the same as hereinabove defined and *a* is 0 to 3, *b* is 0.005 to 2.0 and *a* plus *b* is 0.8 to 3.0; and a sufficient amount of a dialkyltin catalyst for curing said composition.

4,071,645

AQUEOUS COATING COMPOSITION

Joe E. Kahn, Hartland, Wis., assignor to Acme Chemical Company, Milwaukee, Wis.

Filed Mar. 12, 1976, Ser. No. 666,185

Int. Cl.[2] B05D *3/04*

U.S. Cl. 427—340 21 Claims

1. An aqueous coating composition driable to provide a substantially clear finish on a substrate to which the coating composition is applied comprising

an aqueous phase;

a non-volatile, solid film former, which is capable of forming a smooth, substantially colorless, protective film on the substrate, uniformly dispersed in said aqueous phase;

a sufficient amount of a dispsersing agent to form a stable dispersion of said film former in said aqueous phase and to permit said film former upon evaporation of the water to deposit therefrom as a smooth film on the substrate; and

a water-soluble, acid-base indicator which is colored at a pH above a predetermined level and is colorless at a lower pH, said coating composition having a pH below said predetermined level and the amount of said indicator being sufficient to cause the resultant dried film to change to the color of said indicator when an aqueous stripping solution capable of disrupting the resultant dried film and having a pH above said predetermined pH is applied thereto;

whereby, after application of said coating composition on the substrate and evaporation of the water, a substantially colorless, protective film including said indicator is formed on the surface of the substrate, and, upon subsequent application of the stripper solution to the resultant dried film, the wetted film changes to the color of said indicator.

18. A method for treating and preserving the surface of a substrate comprising

applying on the surface of the substrate an aqueous coating composition which is driable to a substantially clear finish and includes as its essential ingredients:

an aqueous base;

a non-volatile, solid film former, which is capable of forming a smooth, substantially colorless, protective film on the substrate and includes an emulsifiable acrylic copolymer, uniformly distributed in said aqueous phase;

a sufficient amount of a dispersing agent to form a stable dispersion of said film former in said aqueous phase and to permit said film former upon the evaporation of the water to deposit therefrom as a smooth film on the substrate; and

an acid-base indicator which is colored at a pH above a predetermined level and is colorless at a lower pH, said coating composition having a pH below said predetermined level and the amount of said indicator being sufficient to cause the resultant dried film to change to the color of said indicator when an aqueous stripping solution capable of disrupting the resultant dried film and having a pH above said predetermined level is applied thereto;

whereby, after application of said coating composition on the substrate and evaporation of the water therefrom, a substantially colorless protective film including said indicator is formed on the surface of the substrate, and, upon subsequent application of the stripper solution to the resultant dried film, the wetted film changes to the color of said indicator.

4,071,646

HIGH SOLIDS CONTENT ACTIVE CLAY COATING FORMULATIONS AND METHODS FOR PRODUCING AND APPLYING THE SAME

Rodney E. Williams, Williamsville, N.Y., assignor to Moore Business Forms, Inc., Niagara Falls, N.Y.

Division of Ser. No. 588,800, June 20, 1975, Pat. No. 4,042,412. This application Apr. 20, 1977, Ser. No. 789,264

Int. Cl.[2] C09C *1/42;* B41M *5/22*

U.S. Cl. 427—358 2 Claims

1. A method for coating paper comprising:

Preparing a coatable formulation comprising water, an active bentonite-type clay, an inactive clayey material selected from the group consisting of chalk and mixtures of chalk and kaolin and a binder, said inactive clayey material being present in the formulation in an amount sufficient to provide a total solids content in the formulation of from about 43 to about 60% by weight and a viscosity of from about 700 to about 7,000 cps; and

applying said formulation to a paper substrate using a blade coater.

4,071,647

RUBBER GOODS

Philip B. McMullen, Ardmore, Northern Ireland, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 465,018, April 27, 1974, abandoned. This application June 21, 1977, Ser. No. 808,508

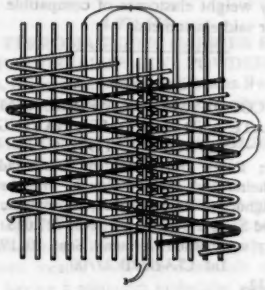
Claims priority, application United Kingdom, May 8, 1973, 21968/73

Int. Cl.[2] B32B *3/06*

U.S. Cl. 428—102 3 Claims

1. A fabric structure for use in reinforcing material in polymeric structures comprising a plurality of parallel warp threads and at least one layer of a plurality of parallel weft threads extending transversely at an angle of 75° to 90° to said warp threads and positioned on one side thereof and means stitch-bonding said warp and weft threads into a unitary construction, each of said warp threads being formed of a plurality of continuous filaments and having no more than two twists

per inch of length whereby the extensibility of said warp threads is reduced to a minimum, said unitary construction



providing increased penetration of the polymetric material into the fabric structure.

4,071,648

ELECTRON RADIOGRAPH RECEPTOR

Murray Samuel Welkowsky, Chatsworth, Calif., assignor to Xonics, Inc., Van Nuys, Calif.

Continuation-in-part of Ser. No. 532,053, Dec. 12, 1974, abandoned, which is a continuation-in-part of Ser. No. 398,484, Sept. 18, 1973, abandoned, which is a continuation-in-part of Ser. No. 362,430, May 21, 1973, abandoned. This application Apr. 21, 1976, Ser. No. 679,067

Int. Cl.[2] B32B *7/02;* **G03G** *13/26, 15/00*

U.S. Cl. 428—212 **18 Claims**

1. A three layer receptor sheet for positioning at an electrode of an imaging chamber to produce an electronradiogram, consisting essentially of an optically transparent dielectric plastic core layer of substantially constant resistivity arranged in contiguous relation between an optically transparent dielectric plastic image carrier layer and an antistatic electrical conducting layer, said image carrier layer having a substantially constant resistivity of at least 10^{14} ohms per square unit of area for receiving on its exposed face an electrostatic image of charges generated externally of the sheet and retaining said charge image while in contact with said core layer and exposed to light, said antistatic electrical conducting layer having a substantially constant resistivity in the range of about 10^{1} to about 10^{12} ohms per square unit of area.

4,071,649

FIREPROOF GLASSWORK

Francis Jacquemin, Monceau-sur-Sambre; Robert Terneau, Montignies-sur-Sambre, and Jean-Pierre Voiturier, Gerpinnes, all of Belgium, assignors to Glaverbel-Mecaniver, Watermael-Boitsfort, Belgium

Continuation of Ser. No. 455,719, March 28, 1974, abandoned. This application May 21, 1976, Ser. No. 688,699

Claims priority, application United Kingdom, Mar. 30, 1973, 15466/73; Germany, Sept. 17, 1973, 43538/73; Sept. 17, 1973, 43536/73

Int. Cl.[2] B32B *17/06*

U.S. Cl. 428—215 **22 Claims**

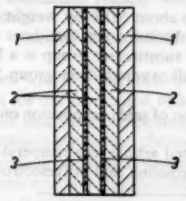
1. A fire screening glazing panel comprising

a first structural ply formed by a vitreous sheet,

a second structural ply formed by a vitreous or plastic sheet,

means for distributing heat uniformly from said first structural ply to said second structural ply upon one of said plies being subjected to heat, said means comprising a plastic membrane selected from the group consisting of polyvinylbutyral and polyurethane, and

a layer on each side of said plastic membrane, each layer comprising a material which is convertible to form a thermally insulating barrier of porous or cellular structure when said panel is subjected to sufficient heat, such as when said panel is subjected to a fire or the like, said heat-convertible barrier forming material being an hydrated metal salt selected from the group consisting of aluminates, plumbates, stannates, alums, borates, alkali



metal silicates and phosphates, said plastic membrane with a layer of heat-convertible material on each side thereof being sandwiched between said first and second plies and each of said layers of barrier forming material being between 0.1 and 8 mm. thick.

4,071,650

FILMS AND ABSORBENT ARTICLES MADE FROM COPOLYMERS HAVING A COPOLYMERIZED CROSSLINKER

James R. Gross, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 494,439, Aug. 5, 1974. This application Aug. 20, 1975, Ser. No. 606,148

Int. Cl.[2] B32B *27/30;* **C08F** *220/34;* **B29D** *7/02*

U.S. Cl. 428—260 **12 Claims**

1. A substantially dry water swellable polyelectrolyte film prepared by the method which comprises

1. preparing a solution which comprises,

I. a solvent selected from the group consisting of water, lower alcohols and mixtures thereof, and

II. about 5 to about 60% by weight based on (I) of a crosslinkable carboxylic copolymer which contains in the copolymer

A. about 25 to about 98% by weight based on the total weight of the copolymer of units derived from an alkali metal salt of an olefinically unsaturated monosulfonic or monocarboxylic acid;

B. about 2 to about 50% by weight of units derived from an olefinically unsaturated monocarboxylic acid; and

C. about 0.1 to about 5.0% by weight of units derived from an N-substituted acrylamide or methacrylamide having the formula

$$H_2C{=}CR{-}C(O){-}NHCH_2{-}O{-}R'$$

wherein R is selected from hydrogen or methyl and R′ is hydrogen or an alkyl group of 1–8 carbons,

2. spreading a coating of said solution on an impervious substrate,

3. heating said coated substrate to a temperature greater than about 30° C to crosslink said polyelectrolyte and

4. separating said crosslinked polyelectrolyte film from said substrate.

7. An absorbent article coated with a substantially dry water swellable polyelectrolyte prepared by the method which comprises

1. preparing a solution which comprises,

I. a solvent selected from the group consisting of water, lower alcohols and mixtures thereof, and

II. about 5 to about 60% by weight based on (I) of a crosslinkable carboxylic copolymer which contains in the copolymer

A. about 25 to about 98% by weight based on the total

weight of the copolymer of units derived from an alkali metal salt of an olefinically unsaturated monosulfonic or monocarboxylic acid:

B. about 2 to about 50% by weight of units derived from an olefinically unsaturated monocarboxylic acid; and

C. about 0.1 to about 5.0% by weight of units derived from an N-substituted acrylamide or methacrylamide wherein the substitutent group is a hydroxy methylene or an alkoxymethylene group having 1–8 carbons,

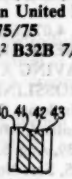
2. applying a solution of said composition on a relatively thin article,

3. heating said coated article to a temperature greater than about 30° C to crosslink said polyelectrolyte.

4,071,651
TREATMENT OF FIBROUS MATERIAL

Denis Raymond Hicklin, Bath; Derek Graham Walter White, and Brian William Attwood, both of Bristol, all of England, assignors to Karl Kroyer St. Anne's Limited, Bristol, England

Continuation of Ser. No. 617,647, Sept. 29, 1975, abandoned.
This application Jan. 4, 1977, Ser. No. 756,713
Claims priority, application United Kingdom, Oct. 10, 1974, 43985/74; Apr. 9, 1975, 14475/75
Int. Cl.[2] B32B *7/00*
U.S. Cl. 428—284 **15 Claims**



1. A method of making a multi-ply consolidated dry-formed essentially cellulosic fibrous web having at least three plies including an outer ply, at least one intermediate ply and a second outer ply, and wherein the intermediate ply or plies is or are impregnated with a sizing agent and in continuous contact with the outer plies, comprising the steps of:

dry-forming said outer ply, dry forming at least one said intermediate ply and dry forming said second outer ply, including sandwiching the intermediate ply between said outer plies in continuous contact therewith and consolidating the three plies together by hot moist pressing thereof into a self-sustaining multi-ply web, each said dry forming step including laying down the cellulosic fibers as a ply in a dry state, and including adding moisture to the dry laid plies prior to said consolidating step,

impregnating said outer plies with a stiffening agent to render them stiffer than the intermediate ply or plies,

and wherein said sizing agent of the intermediate ply or plies has the characteristic of rendering the intermediate ply or plies relatively impervious to the stiffening agent of the outer plies.

4,071,652
THERMALLY CONDUCTIVE ELECTRICAL TAPE

Robert A. Brullo, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 29, 1976, Ser. No. 671,572
Int. Cl.[2] B32B *5/16, 27/20*
U.S. Cl. 428—323 **8 Claims**

1. A thermally conductive tape capable of insulating heated conductor surfaces carrying high current densities, said tape being a strip formed of a composition comprising a blend comprised of ethylene propylene elastomer and an elastomer based principally on isobutylene, sufficient semi-reinforcing or non-reinforcing, non-black filler having a thermal conductivity of at least 1.1×10^{-3} cal-cm/cm^2·°C-sec to endow the tape with a thermal resistivity of no more than 350° C-cm per watt, a modulus at 50% elongation of less than about 350 psi, and an ultimate elongation greater than about 700%, about 10–50 parts per 100 parts by weight elastomer of thermoplastic resin selected from polyethylene and polypropylene or mixtures thereof, about 5–75 parts per 100 parts by weight elastomer of compatible tackifier for said elastomer, and about 10–50 parts per 100 parts by weight elastomer of compatible plasticizers and softeners for said elastomers.

4,071,653
POWDERY COPOLYMER COMPRISING METHYL METHACRYLATE AND MONOMER HAVING A BASIC NITROGEN ATOM

Hanns Boessler; Peter Quis, both of Darmstadt; Joachim Buechse, Astheim, and Hubert Rauch, Weiterstadt, all of Germany, assignors to Rohm GmbH, Darmstadt, Germany

Filed Sept. 27, 1976, Ser. No. 727,013
Claims priority, application Germany, Sept. 30, 1975, 2543542
Int. Cl.[2] B32B *33/00*
U.S. Cl. 428—332 **9 Claims**

1. A powdery copolymer having a powder particle size from 0.1 to 200 microns, said copolymer comprising 50 to 99.8 percent by weight of methyl methacrylate, 0.2 to 10 percent by weight of at least one monomer having a basic nitrogen atom, 0 to 49.8 percent by weight of at least one other monomer selected from the group consisting of alkyl acrylates having 1 to 4 carbon atoms in the alkyl group, alkyl methacrylates having 2 to 4 carbon atoms in the alkyl group, acrylonitrile, styrene, vinyl toluene, α-methyl styrene, and vinyl esters, and 0 to 10 percent by weight of at least one member selected from the group consisting of vinyl pyrrolidone and the hydroxyalkyl esters, amides, methylolamides, and methylol ether amides of acrylic acid and methacrylic acid, said copolymer being prepared by emulsion copolymerization such that at least 50 percent by weight of the monomer or monomers having a basic nitrogen atom is first added to the monomer or monomers not having a basic nitrogen atom after the polymerization of at least half of said monomer or monomers not having a basic nitrogen atom, the resulting copolymer then being recovered from the resultant latex in powder form.

4,071,654
MAGNETIC RECORDING MEMBER

Hiroshi Ogawa; Kazuhide Ishii; Matsuaki Nakamura; Yasuo Tamai, and Goro Akashi, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Aug. 28, 1975, Ser. No. 608,500
Claims priority, application Japan, Aug. 28, 1974, 49-98468
Int. Cl.[2] G11B *5/78*
U.S. Cl. 428—336 **5 Claims**

1. A magnetic recording material comprising a nonmagnetic flexible support up to 50 μm thick having thereon a magnetic recording layer comprising a ferromagnetic powder dispersed in a binder, the surface of said non-magnetic flexible support having the magnetic recording layer thereon satisfying an S-factor expressed by the following relationship (I-1)

$$S_1 \leqq \frac{d + 1.15}{15} \quad \text{(I-1)}$$

wherein S_1 is the surface roughness in μm of the surface of the non-magnetic flexible support having the magnetic recording layer thereon and d is the thickness in μm of the magnetic recording layer, with the thickness (d) of the magnetic recording layer being about 3 μm or less, and the back surface of said non-magnetic flexible support opposite that having said magnetic recording layer thereon satisfying an S-factor expressed by the following relationship (I-2).

$$\frac{d + 1.15}{15} < S_2 \leqq 0.8 \quad \text{(I-2)}$$

wherein S_2 is the surface roughness in μm of the back surface

of the non-magnetic support opposite that having said magnetic recording layer thereon and d is as described above.

4,071,655

TREATED FERROMAGNETIC CARRIER PARTICLES FOR DEVELOPMENT POWDERS

George Brana, Bridgeport, Conn., and Bheema Rao Vijayendran, Berkley Heights, N.J., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Dec. 20, 1976, Ser. No. 752,363
Int. Cl.[2] G03G *9/10, 9/14*
U.S. Cl. 428—403 7 Claims

1. A ferromagnetic carrier particle for use in electrophotographic development of latent images capable of inducing an electrostatic charge in a toner mixed therewith the surface of which has been treated with a sodium salt of polystyrene sulfonic acid having a minimum molecular weight of 50,000, said treated particle having a charge to mass ratio of 24×10^{-6} to 36×10^{-6} coul/gm.

4,071,656

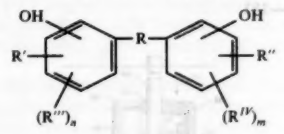
PLATED POLYPROPYLENE COMPOSITION

Robert W. Miller, Mentor, and Samuel Garry Howell, Cincinnati, both of Ohio, assignors to ARCO Polymers, Inc., Philadelphia, Pa.

Continuation-in-part of Ser. No. 108,764, Jan. 22, 1971, Pat. No. 3,929,702, which is a continuation-in-part of Ser. No. 13,042, Feb. 20, 1970, abandoned. This application Oct. 29, 1975, Ser. No. 626,709
Int. Cl.[2] B23P *3/00;* C25D *5/56*
U.S. Cl. 428—626 10 Claims

1. A shaped plastic article having a predetermined surface configuration, formed from a polymer composition, a non-electroplated, electrically conductive coating intimately adhering to said surface; and at least one electroplated metal coating, electroplated to said electrically conductive coating; said polymer composition comprising a polymer selected from the group consisting of polypropylene homopolymers and copolymers or propylene and other alpha-olefins wherein at least 80 percent of the monomer units are propylene, said polymer having incorporated therein:

a. From about 0.1 to about 10.0 parts by weight per 100 parts by weight of polymer of a polyhydroxy aromatic compound selected from the group consisting of resorcinol, alkyl substituted gamma-resorcylic acids, aryl substituted gamma-resorcylic acids, aralkyl substituted gamma-resorcylic acids, and compounds with the scope of the formula:



wherein R is a member selected from the group consisting of sulfur atoms, sulfur containing radicals, and methylene radicals; wherein R' R'', R''' and R^{IV} may be the same or different, and each is a member selected from the group consisting of hydrogen atoms alkyl radicals having less than 15 carbon atoms; and wherein n and m are integers which may be the same or different, and each may be 1, 2, or 3;

b. from about 0.25 to about 20.0 parts by weight per 100 parts by weight of polymer of a rosinous material, said rosinous material being a member selected from the group consisting of natural rosins, wood rosin esters, polymeric rosinous materials, hydrogenated wood rosins, polyterpene resins, and mixtures of at least two of said members.

4,071,657

METAL SHEET FOR DRAWING

Daniel Raymond Rault, Metz-Vallieres, France, assignor to Societe Lorraine de Laminage Continu, France

Filed Nov. 4, 1975, Ser. No. 628,600
Claims priority, application France, Nov. 6, 1974, 74 36872; Oct. 9, 1975, 75 30984
Int. Cl.[2] B32B *15/00*
U.S. Cl. 428—646 7 Claims

1. A metal sheet which is intended to be subjected to a drawing operation for the fabrication of a shaped metal part, the entire surface of said sheet comprising:

a plurality of substantially similar plateau portions of predetermined dimension and height spaced from one another in both the transverse and longitudinal directions to define valley portions therebetween;

the average ratio of the dimension of said valley portions to the dimension of said plateau portions being from 1:1 to 3:1;

the average dimension of the plateau portions being from 40 to 200 micrometers;

the height of said plateau portions being greater than 6 micrometers.

4,071,658

GLASS FOR METAL SEAL

Paul Millard Phillips, Sugar Grove, Pa., and John Gleason Donaldson, Tustin, Calif., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Dec. 3, 1976, Ser. No. 747,362
Int. Cl.[2] B32B *15/16, 15/18, 15/20*
U.S. Cl. 428—555 7 Claims

1. A glass to metal seal of a metallic composite, said composite comprising:

a central core portion of a wrought nickel-iron alloy wherein said nickel comprises about 42 percent by weight of said core with the balance iron;

a substantially uniformly thick sheath portion of a low carbon steel alloy bonded about said core portion; and

a substantially uniformly thick shell portion of a glass wetting metal bonded about said sheath portion, said composite having an average coefficient of thermal expansion within the range of from about 7.5 to about 10.0 cm/cm/° $C \times 10^{-6}$ over a temperature range of from about 25° C to about 400° C.

4,071,659

SOLAR ABSORPTION SURFACE PANEL

Teuvo J. Santala, Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 13, 1975, Ser. No. 631,792
Int. Cl.[2] F24J *3/02;* B32B *15/18, 15/20*
U.S. Cl. 428—677 4 Claims

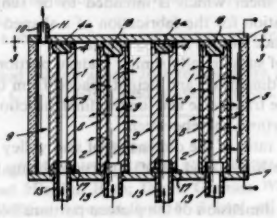
1. In a solar collector plate having a core and an absorption surface thereon, the improvement comprising said surface being made from an intermetallic compound of aluminum and nickel and formed by joining layer of aluminum and a layer of nickel which is at least 66 percent as thick as said aluminum layer and heating said joined layers to a temperature between 1000° F and 1550° for a period of 5 minutes to one hour, said intermetallic compound having a sponge like surface morphology which results in high absorptance and low infrared emittance values.

4,071,660

ELECTRODE FOR A ZINC-CHLORIDE BATTERY AND BATTERIES CONTAINING THE SAME

Thomas G. Hart, Royal Oak, Mich., assignor to Energy Development Associates, Madison Heights, Mich.

Filed Apr. 26, 1976, Ser. No. 680,141
Int. Cl.[2] H01M *10/38*
U.S. Cl. 429—15 7 Claims



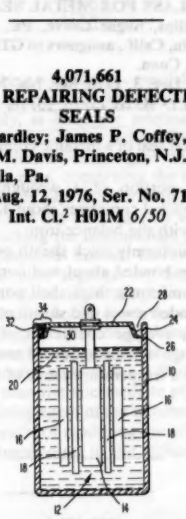
1. A zinc-chlorine high energy density battery comprising a chamber, means to withdraw gas from the chamber, at least one chlorine electrode within the chamber, at least one aqueous zinc chloride electrolyte porous zinc electrode within the chamber, means to introduce substantially dechlorinated electrolyte into the interior of the zinc electrode, and means to withdraw the electrolyte from the chamber.

4,071,661

PROCESS FOR REPAIRING DEFECTIVE BATTERY SEALS

Philip Bernstein, Yardley; James P. Coffey, Hatboro, both of Pa., and Stanley M. Davis, Princeton, N.J., assignors to ESB Incorporated, Phila, Pa.

Filed Aug. 12, 1976, Ser. No. 713,682
Int. Cl.[2] H01M *6/50*
U.S. Cl. 429—49 9 Claims



1. A process for repairing while in service, a secondary battery which is comprised of a container, a cover, a cell element located in the container, the element having an anode, a cathode, a separator and electrolyte, and a sealant area comprised of a sealant space, a sealant located in the sealant space and areas of the container and cover near the sealant space, said sealant area being defective in that the sealant contains cracks and voids;

the process comprising

1 preparing the sealant area;

2 positioning a repairant tape over the defective sealant, the tape comprising

95–60% by weight atactic polypropylene, and

5–40% by weight non-conductive filler; and

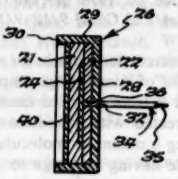
3 heating the repairant tape to a temperature sufficient to coat and repair the defective sealant area.

4,071,662

LITHIUM-IODINE BATTERY HAVING COATED ANODE

Ralph T. Mead, Kenmore; Wilson Greatbatch, Clarence, and Frank W. Rudolph, Depew, all of N.Y., assignors to Wilson Greatbatch Ltd., Clarence, N.Y.

Division of Ser. No. 525,051, Nov. 19, 1974, Pat. No. 3,957,533.
This application Jan. 7, 1976, Ser. No. 647,002
Int. Cl.[2] H01M *2/02*
U.S. Cl. 429—178 12 Claims



1. An anode for a lithium-iodine cell wherein the cathode contains a charge transfer complex of an organic donor component and iodine, said anode comprising:

a. a lithium element having a surface adapted to be operatively associated with the cathode in the cell; and

b. a protective coating on said lithium anode surface consisting essentially of an organic electron donor component material, said protective coating preventing recrystallization of iodine on said lithium anode surface when the charge transfer complex contacts said lithium anode surface through said protective coating so as to maximize the area of said lithium anode surface operatively contacted by the charge transfer complex.

9. A method of making an anode for use in a lithium-iodine cell wherein the cathode contains a charge transfer complex of an organic donor component and iodine comprising the steps of:

a. providing an anode including a lithium element having a surface adapted to be operatively associated with the cathode in the cell; and

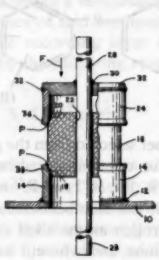
b. applying a protective coating to said anode surface, said coating consisting essentially of an organic electron donor component material.

4,071,663

BATTERY FEEDTHROUGH PENETRATOR

Ambrose M. Bredbenner, Jr., Averill Park, N.Y., assignor to Interpace Corporation, Parsippany, N.J.

Filed Apr. 1, 1977, Ser. No. 783,672
Int. Cl.[2] H01M *2/06*
U.S. Cl. 429—181 8 Claims



1. In a battery having a housing provided with a circular opening, an electrical feedthrough penetrator comprising:

a first cylindrical metal sleeve outwardly extending from the housing of the battery and fixed to the peripheral edge of the housing surrounding the opening;

a tubular ceramic member of high compressive strength being provided with an axial passageway, said tubular

ceramic member having a first end portion tapered from a first outside diameter which is less than the inside diameter of said first cylindrical metal sleeve to a second outside diameter which is greater than said inside diameter and a second end portion tapered from a third outside diameter to a fourth outside diameter, the tapered first end portion of said tubular ceramic member being compressively fitted in the end portion of said first cylindrical metal sleeve remote from the battery housing;

a second cylindrical metal sleeve having an inside diameter intermediate said third and fourth outside diameters, a metal cap fixed to and covering one end portion of said second cylindrical sleeve, said cap being provided with a central opening; and

a rod-like conductor fixed to said cap and extending through the central opening thereof in both directions;

the other end portion of said second cylindrical sleeve being fitted to the second end portion of said tubular ceramic member with said rod-like conductor extending through the axial passageway of said tubular ceramic member into the region encompassed by said first cylindrical sleeve.

8. A method of providing a feedthrough penetrator for a battery having a housing with a circular opening comprising the steps: plating with a malleable metal the inner wall of one end portion of a first cylindrical metal sleeve having a given inside diameter, fixing the other end portion of said first cylindrical sleeve to the housing about the circular opening, providing a tubular element of ceramic material with high compressive strength, said tubular element having a central passageway and being tapered at each end portion from a first outside diameter which is less than said given inside diameter to a second outside diameter which is greater than said given inside diameter, resting one end portion of said tubular element in the said one end portion of said first cylindrical sleeve, plating with said malleable metal the inner wall of one end portion of a second cylindrical metal sleeve having said given inside diameter, fixing to the other end portion of said second cylindrical sleeve a cap being provided with a central opening, fixing to said cap a rod-like conductor which extends in both directions from said central opening, resting the other end portion of said second cylindrical sleeve onto the other end portion of said tubular element with the rod-like conductor passing through the central passageway thereof into the region surrounded by said first cylindrical sleeve, and axially ramming said cylindrical sleeves toward each other whereby the plating material on the inner walls of said sleeve is smeared over the abutting surface of said tubular element to provide a seal.

4,071,664

ELECTROLYTE SALT ADDITIVE

Arabinda N. Dey, Needham, Mass., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed Apr. 1, 1977, Ser. No. 783,585

Int. Cl.[2] H01M 6/14

U.S. Cl. 429—194 **14 Claims**

1. An electrochemical cell comprising an anode, a cathode depolarizer, a cathode collector, and an electrolyte comprising said depolarizer having dissolved therein a first electrolyte salt and a minor amount of a second salt having a metal cation and a clovoborate anion, said second salt being present in an amount sufficient to alleviate voltage delay.

4,071,665

HIGH ENERGY DENSITY BATTERY WITH DIOXOLANE BASED ELECTROLYTE

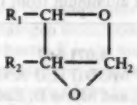
Bruce Hollis Garth, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 289,592, Sept. 18, 1972, abandoned, and a continuation-in-part of Ser. No. 249,048, Aug. 1, 1972, abandoned, which is a continuation-in-part of Ser. No. 112,413, Feb. 3, 1971, abandoned. This application July 29, 1974, Ser. No. 492,937

Int. Cl.[2] H01M 6/16

U.S. Cl. 429—197 **2 Claims**

1. In a high energy density galvanic battery comprising at least one voltaic cell comprising a lithium metal anode, an electrolyte solution and a cathode depolarizer reducible by the lithium anode, the improvement comprising a non-aqueous electrolyte solution in which the electrolyte solvent consists essentially of from 99.9 to about 50% by weight of a dioxolane of the formula



wherein R_1 and R_2 are the same or different and are hydrogen or alkyl of one to three carbon atoms, from 0 to about 50% by weight of an ether selected from aliphatic ethers and cycloaliphatic carbohydric ethers having a molecular weight of no more than about 165, an about from 0.1% to 10% by weight of a tertiary nitrogen base, dissolved therein sufficient nonreactive conductive salt to provide a conductivity at 25° C. of 1×10^{-4}ohm^{-1}cm^{-1}.

4,071,666

ELECTROCONDUCTIVE RESINS AND INTERMEDIATES AND ELECTROCONDUCTIVE COATED PAPER

Joseph L. Garner, Sanford, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 19, 1976, Ser. No. 668,335

Int. Cl.[2] C08K 5/03

U.S. Cl. 526—1 **12 Claims**

1. A composition comprising, by weight:

Component A. from about 85 to about 95 parts of a polystyrene characterized by a weight average molecular weight, $\overline{M}_w$, of about 5,000 to about 45,000 and an average molecular weight distribution, $\overline{M}_w/\overline{M}_n$, of about 2 to about 6; and

Component B. from about 15 to about 5 parts of a cyclic hydrocarbon of from 9 to about 25 carbon atoms which may contain up to two hetero-oxygen atoms, comprising 1 to 3 benzoaromatic rings;

which composition has been chloromethylated or bromomethylated to introduce chloromethyl or bromomethyl groups on about 70 to 90 percent of the aromatic rings thereof.

4,071,667

PROCESS OF PREPARING POLYESTERS HAVING CARBONYL GROUP AND ETHER LINKAGE IN THE PRINCIPAL CHAIN THEREOF

Sakuji Ikeda, Tokyo, and Kazuo Soga, Yokohama, both of Japan, assignors to Tokyo Institute of Technology, Tokyo, Japan

Filed Jan. 2, 1976, Ser. No. 646,013

Int. Cl.[2] C08G 67/00

U.S. Cl. 526—11.1 **8 Claims**

1. A process of preparing poylesters having carbonyl groups and ether likages in the principal chain thereof which consists essentially of reacting carbon dioxide with vinyl compounds or diene compounds having Alfrey-Prices values of less than −0.9.

4,071,668

ALUMINUM CONTAINING ALKENYLBENZENE RESIN

George G. Merkl, 46 Sunset Court, Haworth, N.J. 07641

Continuation-in-part of Ser. No. 305,819, Nov. 13, 1972, abandoned. This application Nov. 29, 1976, Ser. No. 745,835

Int. Cl.[2] C08F *30/04;* C08K *5/16;* C08G *2/00, 69/44*

U.S. Cl. 526—11.1 8 Claims

1. A method of preparing an aluminum containing resin which comprises:

contacting and reacting under resin promoting conditions

I. activated aluminum comprising high purity aluminum metal activated through permeation with a metal selected from mercury, gallium and indium/gallium alloys and

II. a resin forming alkenylbenzene monomer system

said activated aluminum being present in an amount effective to catalyze the resin formation and to introduce into the formed resin up to 5.0% by weight aluminum; and

terminating the resin formation reaction by withdrawing unreacted aluminum from the reaction system.

4,071,669

METAL SALTS OF MODIFIED ANHYDRIDE RESIN

James J. Tazuma, Stow, and Mario D. Zadra, Barberton, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed June 24, 1976, Ser. No. 699,910

Int. Cl.[2] C08F *8/42*

U.S. Cl. 526—47.3 8 Claims

1. A metal salt of an anhydride-modified resin prepared by the method which comprises reacting in an aqueous medium (A) about 0.4 to about one equivalent of a water soluble salt selected from chlorides and nitrates of metals selected from zinc, aluminum, lead and cobalt andmone equivalent of (B) the sodium or potassium salt of the half acid/half ester of said anhydride-modified resin; where said half acid/half ester salt is prepared by (1) reacting said anhydride-modified resin to reduce its acid number about 40–60 percent with an alcohol selected from methanol, ethanol, isopropanol, n-butanol and isooctyl alcohol and (2) reacting the product thereof as a mixture with an aqueous solution of about 75 to 110 stoichiometric percent of a hydrozide selected from at least one of sodium hydroxide and potassium hydroxide; where said anhydride-modified resin is comprised of about 45 to about 55 mole percent units derived from maleic anhydride and, correspondingly, about 55 to about 45 mole percent units derived from a piperylene/methyl branched monoolefin backboned resin comprising about 40 to about 70 weight percent units derived from piperylene and correspondingly about 60 to about 30 weight percent units derived from at least one methyl branched α or β monoolefin containing 4 to 6 carbon atoms, where the weight ratio of piperylene to said branched monoolefin is in the range of about 0.8/1 to about 2/1.

4,071,670

METHOD OF SIZING MONOMER DROPLETS FOR SUSPENSION POLYMERIZATION TO FORM SMALL PARTICLES

Edward Vanzo, Webster, and Lewis S. Smith, Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 2, 1976, Ser. No. 710,495

Int. Cl.[2] C08F *2/20, 12/08, 20/18*

U.S. Cl. 526—88 9 Claims

1. A method of small particle formation comprising mixing a monomer composition in an aqueous solution comprising water and a stabilization agent, subjecting the mixture to high shear agitation for a short time of about 0.5 to about 5 minutes to size the monomer, transferring the sized monomer to a reaction vessel, slowly agitating the sized monomer in said reaction vessel, polymerizing the monomer and recovering polymeric particles of small, uniform size distribution wherein 95 percent of said polymeric particles range between about 5 and about 25 microns as a result of said shear agitation to size the monomer.

4,071,671

COPOLYMER OF GLYCIDYL METHACRYLATE AND ALLYL GLYCIDYL ETHER

Sheldon I. Schlesinger, East Windsor Township, Mercer County, N.J., and Veronica Cochran, Armonk, N.Y., assignors to American Can Company, Greenwich, Conn.

Continuation-in-part of Ser. No. 509,674, Sept. 26, 1974, abandoned, which is a division of Ser. No. 297,829, Oct. 16, 1972, abandoned. This application June 18, 1976, Ser. No. 697,654

Int. Cl.[2] C08F *216/14, 220/32*

U.S. Cl. 526—89 11 Claims

1. A copolymer of glycidyl methacrylate and allyl glycidyl ether having pendant epoxy groups, an inherent viscosity of at least about 0.25 as measured in butyronitrile at 25° C, an epoxide equivalent of at least about 0.65 epoxide equivalent per 100 grams of polymer and polymerizable to higher molecular weights through said epoxy groups by the action of a cationic catalyst; said copolymer being derived from reaction of a mixture of said monomers consisting of from about 4 to about 5 moles of glycidyl methacrylate per mole of allyl glycidyl ether in the presence of a catalyst effective to initiate polymerization through ethylenic unsaturation of the monomers in a solvent at a reaction temperature below about 100° C.

4,071,672

PROCESS FOR POLYMERIZING OR COPOLYMERIZING OLEFINS

Norio Kashiwa, Iwakuni, Japan, assignor to Mitsui Petrochemical Industries Ltd., Tokyo, Japan

Continuation of Ser. No. 412,612, Nov. 5, 1973, abandoned. This application July 28, 1975, Ser. No. 599,582

Claims priority, application Japan, Nov. 10, 1972, 47-112151; Dec. 27, 1972, 48-130052

Int. Cl.[2] C08F *4/02, 10/02*

U.S. Cl. 526—122 26 Claims

1. In a process for polymerizing or copolymerizing olefins in the presence of a catalyst consisting essentially of:

A. from 0.001 to 0.5 millimols calculated as the titanium or vanadium atoms per liter of the inert organic liquid medium of a transition metal catalyst compound prepared by reacting in an inert organic liquid medium

1. a titanium or vanadium compound selected from the group consisting of compounds of the formula TiX_4 wherein X is a halogen atom, compounds of the formula $Ti(OR)_{4-n}X_n$ wherein X is the same as defined above, R is an alkyl group, and n is zero or a positive number of less than 4, compounds of the formula VOX_3 wherein X is the same as defined above, and compounds of the formula VX_4 wherein X is the same as defined above, with

2. a solid carrier of a magnesium compound; and

B. at least 0.01 millimol per liter of the inert organic liquid medium of an organometallic compound catalyst component of a metal of Groups I to III of the periodic table selected from the group consisting of: compounds of the formula RM wherein R is an alkyl or aryl group, and M is lithium, sodium, or potassium; compounds of the formula R_2M' wherein R is the same as defined above and M' is zinc or cadmium; compounds of the formula $R_{2-l}MgX_l$ wherein R is the same as defined above, X is a halogen atom, and l is zero or 1; compounds of the formula $MAlR_4$ wherein R and M are the same as defined above; compounds of the formula $R'_{3-m}AlX_m$ wherein R' is a hydrogen atom, or an alkyl or aryl group, X is the same as defined above, and m is zero or a positive numer not greater than 3; compounds of the formula $R'_{3-n}Al(OR)_n$ wherein R' and R are the same as defined above, and n is a positive number greater than zero but not greater than 3;

and compounds of the formula RAl(OR)X wherein R and X are the same as defined above; and with the proviso that where there are two or more of R, R', and X in the above formulae, they may be the same or different;

the improvement wherein the transition metal catalyst compound is formed by reacting together:

a. a magnesium compound adduct which is the reaction product of

aa. 1 mol of a magnesium dihalide, with

ab. from 0.1 to 10 mols of an electron donor selected from the group consisting of: water; aliphatic alcohols; aliphatic carboxylic acids; aliphatic carboxylic acid esters; aromatic carboxylic acid ester; aliphatic ketones; and aromatic ketones; with the proviso that the acids and alcohols each have from 1 to 12 carbon atoms, the esters have not more than 12 carbon atoms in each of their constituent acid and alcohol moieties, and the ketones have not more than 13 carbon atoms, said reaction being carried out at a temperature of -10 to $+100°$ C.;

b. a compound of silicon or tin present in an amount of from 1/50 to 50 molar times per mol of the electron donor, having the formula $R_1R_2R_3XSi$, or $R_1R_2R_3XSn$, wherein R_1, R_2 and R_3 are the same or different, and are each selected from the group consisting of hydrogen, alkyl, aryl, alkoxy, aryloxy, and halogen, and wherein X is a halogen; and

c. a compound of titanium or vanadium selected from the group consisting of compounds of the formulae: TiX_4; $Ti(OR)_{4-n}X_n$; VOX_3; and VX_4, wherein X is a halogen atom, R is an alkyl group having 1 to 12 carbon atoms, and n is zero or a positive number of less than 4.

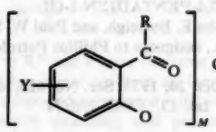
4,071,673

CATALYST AND METHOD

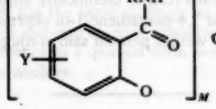
Yu-Tang Hwang, Clinton, Iowa, assignor to Chemplex Company, Rolling Meadows, Ill.

Filed Nov. 3, 1976, Ser. No. 738,555
Int. Cl.² C08F 4/78, 10/00
U.S. Cl. 526—123 **35 Claims**

1. A catalyst prepared by dispersing on a finely divided, difficultly reducible, inorganic support of the class consisting of silica, alumina, thoria, zironia, titania, magnesia, and mixtures thereof a chromium chelate of an orthohydroxy carbonyl compound essentially of the formula of the class consisting of



and



wherein R is individually selected from hydrogen, alkyl, alkenyl, aryl, cycloalkyl, cycloalkenyl, and arylalkyl radicals and combinations of these radicals with each R containing 0–20 carbon atoms and a corresponding valence-satisfying number of hydrogen atoms, X is a negative group relative to chromium selected from the group consisting of halide, alkyl and alkoxy, Y is selected from hydrogen, hydroxyl, alkoxy, and alkyl groups, *m* is a whole number of 1 to 3, *n* is a whole number of 0 to 2, and *m* plus *n* is 2 or 3, and activating the resulting mixture by heating to and at an elevated temperature of from about 600–2000° F. in a non-oxidizing atmosphere.

4,071,674

PROCESS FOR POLYMERIZATION OR COPOLYMERIZATION OF OLEFIN AND CATALYST COMPOSITIONS USED THEREFOR

Norio Kashiwa, Iwakuni; Saburo Fuji, Otake, and Masahide Tanaka, Iwakuni, all of Japan, assignors to Mitsui Petrochemical Industries Ltd., Tokyo, Japan

Continuation of Ser. No. 396,137, Sept. 11, 1973, abandoned. This application Mar. 30, 1976, Ser. No. 672,067
Claims priority, application Japan, Sept. 14, 1972, 47-91807; Mar. 20, 1973, 48-31382
Int. Cl.² C08F 4/02, 10/02
U.S. Cl. 526—125 **10 Claims**

1. A process for polymerizing or copolymerizing olefins in the presence of a catalyst consisting essentially of the reaction product of:

A. a transition metal catalyst component prepared by reacting

(1) a titanium or vanadium compound selected from the group consisting of compounds of the formula TiX_4 wherein X is a halogen atom, compounds of the formula $Ti(OR)_{4-n}X_n$ wherein X is the same as defined above, R is an alkyl group, and n is zero or a positive number of less than 4, compounds of the formula VOX_3 wherein X is the same as defined above, and compounds of the formula VX_4 wherein X is the same as defined above, with

(2) the product formed by a reaction at from $-20°$ to $+100°$ C between

(a) 1 mol of a magnesium dihalide solid carrier comprising an adduct formed by reacting at a temperature of from $-10°$ to $+200°$ C;

(aa) a magnesium dihalide; with

(ab) an aliphatic or aromatic alcohol having from 1 to 12 carbon atoms, present in an amount of from 0.1 to 10 mols per mol of magnesium dihalide; and

(b) an organometallic compound of a metal of Groups I to III of the periodic table selected from the group consisting of compounds of the formula RM wherein R is an alkyl or aryl group, and M is lithium, sodium or potassium, compounds of the formula R_2M' wherein R is the same as defined above and M' is zinc or cadmium, compounds of the formula $R_{2-l}MgX_l$ wherein R is the same as defined above, X is a halogen atom and *l* is 0 or 1, compounds of the formula $MAlR_4$ wherein R and M are the same as defined above, compounds of the formula $R'_{3-m}AlX_m$ wherein R' is a hydrogen atom, or an alkyl or aryl group, X is the same as defined above, and *m* is zero or a positive number of not greater than 3, compounds of the formula $R'_{3-n}(OR)_n$ wherein R' is the same as defined above, and *n* is a positive number greater than 0 but not greater than 3, and compounds of the formula RAl(OR)X wherein R and M are the same as defined above, wherein the organometallic compound (A)(2)(b) is reacted with the magnesium dihalide solid carrier (A)(2)(a) in an amount such that the amount of the organic groups, R and R', of the organometallic compound is 0.1 to 1.5 mols per mol of the alcoholic hydroxy group of the adduct; and

(B) an organometallic compound catalyst component of a metal of Groups I to III of the periodic table selected from the group consisting of compounds of the formula $R'_{3-m}AlX_m$ wherein R' is a hydrogen atom, an alkyl or aryl group, X is a halogen atom, and *m* is 0 or a positive number not greater than 3, compounds of the formula $R'_{3-n}Al(OR)_n$ wherein R' is the same as mentioned above, and *n* is a positive number greater than 0 but not greater than 3, compounds of the formula RAl(OR)X wherein R and X are the same as defined above, compounds of the formula $R_{2-l}MgX_l$ wherein R and X are the same as defined above and *l* is 0 or 1, and dialkyl zincs wherein the amount of the organometallic compound (B) is 1 to 10,000

mols per mol of the titanium or vanadium atom of the titanium or vanadium compound (A)(1).

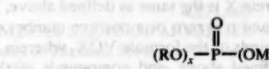
4,071,675

EMULSION POLYMERIZATION OF VINYL CHLORIDE USING MIXED EMULSIFIER SYSTEM IN A SINGLE STEP IN THE ABSENCE OF SEED FORMATION

Arthur J. Yu, Stamford, Conn., and Donald F. Anderson, White Plains, N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Mar. 3, 1977, Ser. No. 774,188
Int. Cl.[2] C08F 2/00, 4/00, 14/06
U.S. Cl. 526—193 9 Claims

1. In an emulsion polymerization procedure for forming vinyl chloride polymers by heating a monomer charge containing at least 50%, by weight, vinyl chloride in the presence of a water soluble initiator and an emulsifier, wherein the improvement comprises using as an emulsifier an effective amount to maintain a stable emulsion of a mixture of: (1) at least one C_{12}–C_{18} straight chain phosphate surfactant of the formula



wherein R is a straight chain alkyl or alkenyl group containing from about 12 to about 18 carbon atoms inclusive, M is an ammonium or alkali metal ion and x is 1 and/or 2 and (2) at least one C_{12}–C_{20} straight chain alkyl or alkenyl alcohol or saturated hydrocarbon having a chain of greater than 18 carbon atoms to effect information of the polymers in a single step in the absence of the initial introduction of seed particles.

4,071,676

HYDROCARBON RESINS

Gerhard Werner, Glashutten; Peter Gräfe, Geisenheim-Marienthal; Richard Sattelmeyer, Schlangenbad-Georgenborn, and Heinz Schmelzer, Rummelsheim, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed May 13, 1976, Ser. No. 686,086
Claims priority, application Germany, May 17, 1975, 2522080
Int. Cl.[2] C08F 232/06
U.S. Cl. 526—283 15 Claims

10. An olefinically unsaturated hydrocarbon resin having a molecular weight of from 400 to 2000, a melting point of from 20° to 140° C (by the capillary method) and a viscosity of from 10 to 5000 cP (as a 70% toluene solution at 20° C) and comprising (a) from 30 to 90% by weight of polymerised units of a dicyclopentadiene component comprising dicyclopentadiene and up to 30% by weight of an at most dialkylated dicyclopentadiene having from 1 to 4 carbon atoms in each alkyl substituent and (b) from 10 to 70% by weight of polymerised units of an aliphatic olefin containing 8 carbon atoms.

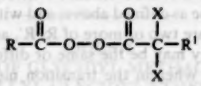
4,071,677

POLYMERIZATION OF ETHYLENICALLY UNSATURATED MONOMERS EMPLOYING ALPHA-HALO SUBSTITUTED DIACYL PEROXIDES

Donald W. Wood, Concord, Calif., assignor to Argus Chemical Corporation, Brooklyn, N.Y.

Division of Ser. No. 205,387, Dec. 6, 1971, Pat. No. 4,032,605, and a continuation-in-part of Ser. No. 675,360, Oct. 16, 1967, Pat. No. 3,652,681. This application Mar. 4, 1977, Ser. No. 774,344
Int. Cl.[2] C08F 4/32, 14/06
U.S. Cl. 526—231 12 Claims

1. A method for initiating the polymerization of a polymerizable monomer containing ethylenic unsaturation comprising subjecting said monomer to polymerization conditions in the presence of a catalytic amount of an organic peroxide of the formula:



wherein

X is hydrogen, chlorine, or bromine, at least one X being chlorine or bromine;

R^1 is saturated aliphatic hydrocarbon of from two to 19 carbon atoms, having from zero to five branches along the chain; and

R is an organic radical of from one to 19 carbon atoms and composed solely of carbon, hydrogen, oxygen and halogen of atomic number nine to 35, with the proviso that R has at least one atom of oxygen or halogen, when R^1 is straight chain.

4,071,678

RANDOM COPOLYMERS OF METHYL METHACRYLATE AND N-OCTADECYL METHACRYLATE

Henry Gisser, and Seymour Portnoy, both of Philadelphia, Pa., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 29, 1976, Ser. No. 681,677
Int. Cl.[2] C08F 220/14, 220/16
U.S. Cl. 526—328 3 Claims

1. Random copolymers useful as a clad film or solid members such as gears, bearings, and the like, comprising the reaction products of the free radical bulk polymerization of n-octadecyl methacrylate and methyl methacrylate, said copolymers having a number average molecular weight ranging from about 7,000 to about 20,100, the mole percentage of the monomer units containing the octadecyl group in said copolymers ranging from about 7% to about 21%, the mole percentage of the monomer units in said copolymers originating from methyl methacrylate ranging from about 79% to about 93%, and said copolymers having coefficients of friction in the range between 0.35 and 0.19 when molded into disks under 3000 psi.

4,071,679

EMULSION POLYMERIZED COPOLYMERS OF 2,4-PENTADIEN-1-OL

Carl A. Uraneck; John E. Burleigh, and Paul W. Solomon, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 24, 1975, Ser. No. 625,746
Int. Cl.[2] C08F 236/14
U.S. Cl. 526—338 25 Claims

1. Copolymers of 2,4-pentadiene-1-ol with a conjugated diene, optionally with a further olefinically unsaturated comonomer, wherein said 2,4-pentadiene-1-ol represents a ratio of about 50:50 to 75:25 weight percent said conjugated diene:2,4-pentadiene-1-ol.

4,071,680

5'-DEOXY-5-FLUOROPYRIMIDINE NUCLEOSIDES

Alan Frederick Cook, Cedar Grove, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Dec. 20, 1976, Ser. No. 752,510
Int. Cl.[2] C07H 19/06
U.S. Cl. 536—23 4 Claims

1. A 5'-deoxy-5-fluoropyrimidine nucleoside selected from the group consisting of 5'-deoxy-5-fluorocytidine, 5'-deoxy-5-fluorouridine and the pharmaceutically acceptable acid addition salts thereof.

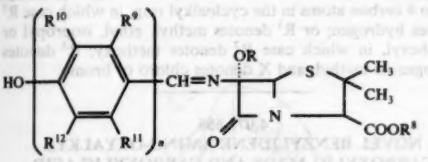
4,071,681
PROCESS FOR PREPARING BETA-LACTAM ANTIBIOTIC SUBSTANCES

Hiroaki Yanagisawa; Akiko Ando; Masami Fukushima, and Hideo Nakao, all of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Division of Ser. No. 501,245, Aug. 28, 1974, Pat. No. 4,016,155.
This application Sept. 28, 1976, Ser. No. 727,696
Claims priority, application Japan, Sept. 7, 1973, 48-100856
Int. Cl.[2] C07D *499/04*
U.S. Cl. 542—420 10 Claims

1. A process for preparing a compound having the formula

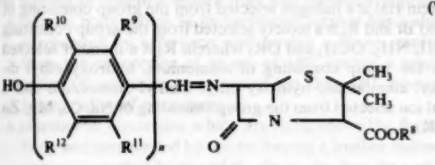
(VII)



wherein R^8 represents a group selected from the group consisting of straight or branched lower alkyl, lower alkoxymethyl, benzyloxymethyl, lower alkanoyloxy lower alkyl, benzoyloxymethyl, cyanomethyl, 2,2,2-trichloroethyl, phthalimidomethyl, benzyl, p-methoxybenzyl, p-nitrobenzyl, benzhydryl, phenacyl, p-bromophenacyl, p-methoxyphenacyl, p-nitrophenacyl, and tri lower alkylsilyl, R^9 to R^{12} may be the same or different and each represents hydrogen or a group selected from the group consisting of straight or branched lower alkyl, lower alkoxy, halogen, cyano, lower alkoxycarbonyl, or R^9 and R^{10} together and R^{11} and R^{12} together may be linked to form a ring fused with the benzene ring to which they are attached,

n is 1 or 2 and R represents a straight or branched alkyl having from 1 to 6 carbon atoms which comprises contacting a penam compound having the formula

(VIII)



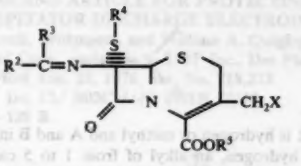
wherein R^8 to R^{12} and *n* have the same meanings as defined above, with a metal oxide in an inert solvent or with a quinone compound substituted with an electron attractive group thereby oxidizing said panam compound to its quinoid form, and contacting the resulting oxidation product with a lower alkanol having the formula R—OH wherein R has the same meaning as defined above, said metal oxide and said quinone compound being one which oxidizes phenol to a quinoid form without destruction of the penam nucleus.

4,071,682
7-α SUBSTITUTED IMINO 7-β SUBSTITUTED THIO CEPHALOSPORIN DERIVATIVES

Joseph Edward Dolfini, Princeton; William A. Slusarchyk, Belle Mead, and William Henry Koster, Pennington, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 395,201, Sept. 7, 1973, abandoned. This application Mar. 18, 1976, Ser. No. 668,007
Int. Cl.[2] C07D *501/18*
U.S. Cl. 544—21 9 Claims

1. A compound of the formula



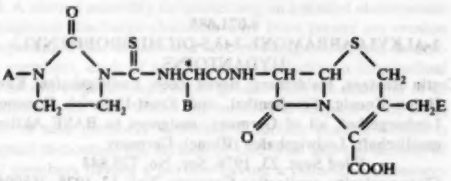
wherein R^2 is lower alkyl, lower alkoxy-lower alkyl, cyano-lower alkyl, cyanomethylthio-lower alkyl, phenyl-lower alkyl, phenoxy-lower alkyl, thienyl-lower alkyl, phenyl or phenyl substituted with halo, lower alkyl, nitro or carbo-lower alkoxy, R^3 is chloro, bromo, lower alkoxy, lower alkylthio or phenoxy, R^4 is lower alkyl, phenyl, benzyl or phenyl or benzyl substituted with nitro, halo, lower alkyl or carbo-lower alkoxy, R^5 is t-butyl, nitrobenzyl, methoxybenzyl, trichloroethyl, benzhydryl, trimethylsilyl, acetoxymethyl or pivaloyloxymethyl and X is hydrogen or lower alkanoyloxy.

4,071,683
OXOIMIDAZOLIDINYLTHIOCARBONYL DERIVATIVES OF CEPH-3-EM-4-CARBOXYLIC ACIDS

Hans-Bodo König; Karl Georg Metzger, and Wilfried Schröck, all of Wuppertal, Germany, assignors to Bayer Aktiengesellschaft, Germany

Division of Ser. No. 518,178, Oct. 25, 1974, Pat. No. 3,966,709.
This application Dec. 22, 1975, Ser. No. 643,542
Claims priority, application Germany, Oct. 30, 1973, 2354219
Int. Cl.[2] C07D *501/20, 501/22*
U.S. Cl. 544—28 10 Claims

1. A compound selected from the group consisting of a cephalosporin of the formula:



and the pharmaceutically acceptable salts thereof wherein

the carbon atom designated C* constitutes a center of chirality;

A is hydrogen or alkyl of 1 to 4 carbon atoms;

B is phenyl, methylphenyl, chlorophenyl, hydroxyphenyl or cyclohexa-1,4-dien-1-yl; and

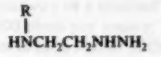
E is hydrogen, hydroxy or acetoxy.

4,071,684
PROCESS FOR PRODUCING 3-SUBSTITUTED 1,2,4-TRIAZINES

Albert J. Schuster, Jr., Midland, Mich., and John Martin, Carmel, Ind., assignors to The Dow Chemical Company, Midland, Mich.

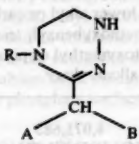
Filed Jan. 21, 1977, Ser. No. 761,177
Int. Cl.[2] C07D *253/06*
U.S. Cl. 544—182 5 Claims

1. A process for preparing a 3-substituted 1,2,4-triazine which comprises reacting a nitrile with 2-aminoethylhydrazine in the presence of a catalytic amount of a transition metal salt or elemental sulfur wherein the 2-amino-ethylhydrazine is represented by the formula



and the nitrile is represented by the formula

wherein R is hydrogen or methyl and A and B independently represent hydrogen, an alkyl of from 1 to 5 carbon atoms, phenyl, substituted phenyl, benzyl, or substituted benzyl; said substitutions on the phenyl and benzyl rings being selected from the group consisting of halo, lower alkyl, lower alkoxy, nitro, napthyl, and pyridyl thereby forming said triazine having the formula



wherein A, B and R are as defined above.

4,071,685

1-ALKYLCARBAMOYL-3-(3,5-DICHLOROPHENYL)-HYDANTOINS

Costin Rentzea, Heidelberg; Bernd Zeeh, Ludwigshafen; Karl-Heinz Koenig, Frankenthal, and Ernst-Heinrich Pommer, Limburgerhof, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

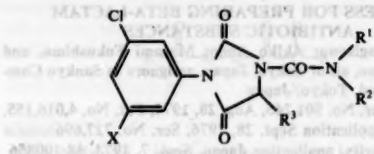
Filed Sept. 23, 1976, Ser. No. 725,843

Claims priority, application Germany, Nov. 13, 1975, 2550964

Int. Cl.[2] C07D *233/90*

U.S. Cl. 548—312 **11 Claims**

1. A hydantoin derivative of the formula



where R^1 denotes halogen-substituted, alkylmercapto-substituted or alkoxy-substituted linear or branched alkyl of 2 to 5 carbon atoms, haloalkenyl of 3 carbon atoms, alkynyl of 4 to 8 carbon atoms, tetrahydropyranyl, unsubstituted or halogen-substituted, alkyl-substituted or alkoxy-substituted cycloalkyl of 3 to 6 carbon atoms in the cycloalkyl ring, in which case R^2 denotes hydrogen; or R^1 denotes methyl, ethyl, isopropyl or cyclohexyl, in which case R^2 denotes methoxy; R^3 denotes hydrogen or methyl; and X denotes chloro or bromo.

4,071,686

NOVEL BENZYLIDENE AMINO-OXYALKYL CARBOXYLIC ACIDS AND CARBOXYLIC ACID DERIVATIVES

Jan van Dijk; Volkert Claassen, and Johannes Maria Antonius Zwagemakers, all of Weesp, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

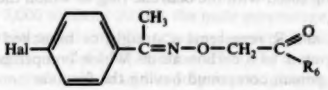
Continuation of Ser. No. 286,874, Sept. 7, 1972, abandoned, which is a continuation of Ser. No. 885,628, Dec. 16, 1969, abandoned. This application Dec. 17, 1976, Ser. No. 751,489

Claims priority, application Netherlands, Dec. 17, 1968, 6818074

Int. Cl.[2] C07C *79/46*; A61K *31/24*

U.S. Cl. 560—35 **5 Claims**

1. A compound of the formula



wherein Hal is a halogen selected from the group consisting of Cl and Br and R_6 is a moiety selected from the group consisting of OH, NH_2, OCH_3 and OR_7 wherein R_7 is a member selected from the group consisting of ammonium, hydroxy ethyl dimethyl ammonium, hydroxy ethyl diethyl ammonium and a metal ion selected from the group consisting of Na, Ca, Mg, Zn and K.

4,071,687

ELECTRIC ARC FURNACE FOR CONTINUOUS MELTING OF DIRECTLY REDUCED IRON OR DIRECTLY REDUCED IRON ORE

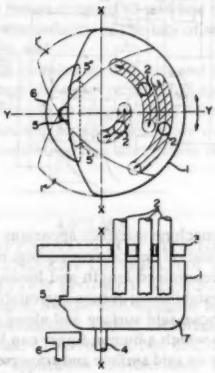
Ryuichi Nakagawa, Seki; Shiro Yoshimatsu, Tokyo; Takuya Ueda, Zushi; Akira Fukuzawa, Yokohama; Tsuyoshi Ozaki, Tokyo; Akira Sato, Ohmiya, and Tatsuro Mitsui, Sagamihara, all of Japan, assignors to National Research Institute for Metals, Tokyo, Japan

Filed Mar. 15, 1976, Ser. No. 667,173

Claims priority, application Japan, Mar. 17, 1975, 50-31085; Mar. 17, 1975, 50-31086; Mar. 17, 1975, 50-31087; Mar. 17, 1975, 50-31088

Int. Cl.[2] H05B *7/20*

U.S. Cl. 13—10 3 Claims



1. A direct-heat arc furnace for the continuous melting of directly reduced iron or directly reduced iron ore and continuous tapping of resulting molten iron, said furnace comprising:

a furnace body which in its horizontal section has a shape surrounded by a furnace wall having a shape resulting from the connection of an arc of 180° having a smaller radius of curvature to an arc of less than 180° having a larger radius of curvature;

a plurality of electrodes which are fixed above the furnace body and surrounded by the arc having a smaller radius of curvature so that the tips of the electrodes face the surface of the charged stock in the furnace;

means for causing a horizontal rotation of the furnace body continuously and repeatedly at an angle of about 45° both in one direction and in the opposite direction about the center of a circle forming the arc having a smaller radius of curvature or its vicinity as a rotating axis;

a tapping port which is secured projectingly to the center of the furnace wall of the arc having a larger radius of curvature; and

a tundish which is disposed below the tapping port spaced apart from the furnace body so as to receive the resulting molten iron;

said continuous and repeated horizontal rotation of the furnace body serving to broaden the area within which to melt the continuously charged stock of the reduced iron or reduced iron ore and render the heat distribution within the furnace uniform, and said rotation of the furnace body of the defined shape in conjunction with the position of the tapping port, permitting the moving distance of the tapping port to be smaller than the maximum distance of the movement of the electrodes relative to the surface of the charged stock.

4,071,688

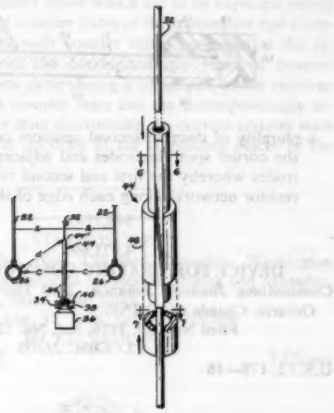
METHOD AND ARTICLE FOR PROTECTING A PRECIPITATOR DISCHARGE ELECTRODE

Jerome G. Lynch, Bridgeport, and William A. Quigley, Greenwich, both of Conn., assignors to UOP Inc., Des Plaines, Ill.

Filed Aug. 18, 1976, Ser. No. 715,273

Int. Cl.[2] B03C *3/40;* H01B *17/58*

U.S. Cl. 174—138 R 7 Claims



1. A method of protecting an installed electrostatic precipitator discharge electrode wire from power arc erosion adjacent its lower end comprising the step of placing a plastic insulating shroud completely around the wire along the length of the wire subject to power arc erosion.

3. A shroud assembly for protecting an installed electrostatic precipitator discharge electrode wire from power arc erosion comprising a pair of first and second elongated plastic insulating members, each of said members including a longitudinal slot on one edge having a depth greater than the diameter of an electrode wire with which the member is adapted to be used, each of said members including a surface portion which is adapted to contact the surface of said wire and the second of said members having a portion having a transverse cross-sectional configuration which is complementary to the transverse cross-section of that portion of the slot in said first member which extends radially outwardly of said wire when installed thereon, each of said first and second members being adapted to be moved normally into contact with said wire at spaced locations along the length of said wire and then axially along said wire into overlying interlocking engagement with each other.

4,071,689

LUCENT ELECTROGRAPHIC SENSOR FOR DETERMINING PLANAR COORDINATES

John E. Talmage, and L. Dexter Bates, both of Oak Ridge, Tenn., assignors to Elographics, Incorporated, Oak Ridge, Tenn.

Filed Sept. 27, 1976, Ser. No. 727,153

Int. Cl.[2] G08C *21/00*

U.S. Cl. 178—18 7 Claims

1. A lucent electrographic sensor for use in determining *x*- and *y*-coordinates of a point, which comprises:

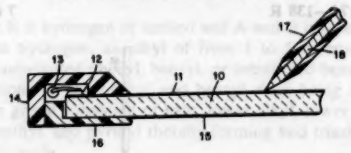
a rigid sheet of transparent substrate;

a substantially transparent, chemically stable uninterrupted resistive layer of a semiconducting metal oxide adherently deposited on one face of the substrate in an amount to produce a sheet resistivity of a selected value in the range of about 100 to 3000 ohms per square;

corner spot electrodes in each corner of the sensor in electrical contact with the resistive layer;

a plurality of spaced-apart edge spot electrodes along each edge of the sensor in electrical contact with the resistive layer;

a plurality of discrete first resistors connected between adjacent of all of the edge spot electrodes; and



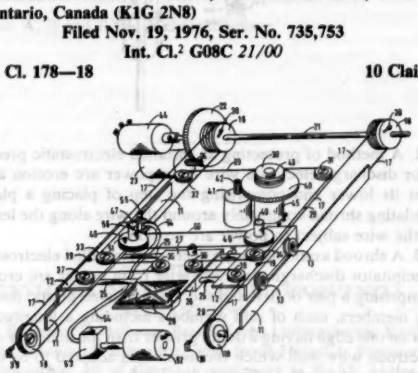
a plurality of discrete second resistors connected between the corner spot electrodes and adjacent edge spot electrodes whereby the first and second resistors form series resistor networks along each edge of the sensor.

4,071,690

DEVICE FOR GRAPHIC COMMUNICATION

Constantinos Joannou Joannou, 2008 Dorval Ave., Ottawa, Ontario, Canada (K1G 2N8)

Filed Nov. 19, 1976, Ser. No. 735,753
Int. Cl.² G08C *21/00*
U.S. Cl. 178—18 **10 Claims**



1. A device for sending or receiving graphic information comprising:

a. a plate of dielectric material on which writing paper may be affixed;

b. a first stylus for writing graphic information, said stylus being made to radiate an RF signal;

c. a movable electrode assembly located underneath said dielectric plate and arranged to sense said RF signal radiated by said first stylus;

d. servo systems arranged to move said electrode assembly in the *x* and *y*-directions in response to signals received by said electrode assembly, and in such a way as to follow said first stylus;

e. potentiometers connected to said servo systems via linkages and arranged to produce electrical signals corresponding to positions of said electrode assembly;

f. a first set of two shafts connected to said servo systems via linkages and arranged to be accessible through slots cut on each side of said dielectric plate, said shafts being arranged to move along said slots when one of said servo systems is operated and said shafts being arranged to rotate about their axes when another of said servo systems is operated;

g. a stylus holding assembly comprising a second stylus for reproducing graphic information, said assembly being removably attached to said first set of shafts so that when said first set of shafts rotates and/or moves along said slots said second stylus moves in the *x* and/or *y*-directions, said stylus holding assembly providing means for lowering and lifting said second stylus on and off said paper;

h. means for converting said signals produced by said potentiometers into suitable form for transmission through telephone line and/or into binary data for feeding into a computer or into signals capable of being recorded on and retrieved from a magnetic tape;

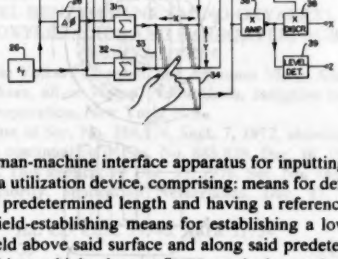
i. means for converting signals received from a computer, tape recorder, or from another similar device into signals suitable for operating said servo systems.

4,071,691

HUMAN-MACHINE INTERFACE APPARATUS

William Pepper, Jr., Bethesda, Md., assignor to Peptek, Inc., Bethesda, Md.

Filed Aug. 24, 1976, Ser. No. 717,192
Int. Cl.² G08C *21/00*
U.S. Cl. 178—19 **21 Claims**



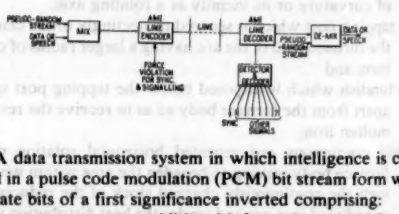
1. A human-machine interface apparatus for inputting information to a utilization device, comprising: means for defining a surface of predetermined length and having a reference point thereon; field-establishing means for establishing a low level electric field above said surface and along said predetermined length and into which a human finger can be inserted to touch a selected point on said surface and traverse a path therealong, said electric field having a parameter that varies continuously along said predetermined length as a function of distance from said reference point; and detector means for detecting the position of said touched point on said surface and the path traversed thereby with respect to said reference point and producing an electrical signal corresponding thereto as an input signal to said utilization device.

4,071,692

DATA TRANSMISSION SYSTEMS

Donald A. Weir, Goff's Oak; Eric S. Usher, Ware, and George A. Howells, Bishops Stortford, all of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Oct. 8, 1976, Ser. No. 730,876
Claims priority, application United Kingdom, Oct. 23, 1975, 43564/75
Int. Cl.² H04L *15/00*; H04B *1/04*
U.S. Cl. 178—68 **4 Claims**



1. A data transmission system in which intelligence is conveyed in a pulse code modulation (PCM) bit stream form with alternate bits of a first significance inverted comprising:

first means to convey additional information to said intelligence by violations of a rule that alternate bits of said first significance are inverted, so that two successive bits of said first significance with the same polarity indicates the presence of said additional information;

second means coupled to the input of said first means to mix said bit stream with a pseudo-random bit stream prior to

operation of said first means, the output signal of said first means being transmitted;

said second means mixing said bit stream and said pseudo-random bit stream by binary addition without carry;

said first means providing synchronization information for transmission in said bit stream by violating the alternate inversion rule with respect to a first bit of each PCM bit combination at least once in each PCM frame, and signalling information being conveyed by violating the alternate inversion rule with respect to a bit of each PCM bit combination other than said first bit; and

a line decoder coupled to the output of said first means to provide a first output signal when a bit of said first significance has a first polarity and a second output signal when a bit of said first significance has a second polarity;

a first bistable means coupled to said line decoder changing its state on each bit of said first significance;

a second bistable means coupled to said line decoder changing its state as the polarity of the bits of said first significance alternates; and

comparison means coupled to said first and second bistable means to compare the states of said first and second bistable means to provide an output signal when the states of said first and second bistable means are out of step, said output signal indicating that a violation of said rule has taken place.

4,071,693

METHOD AND APPARATUS FOR SYNCHRONIZING A RECEIVER END-KEY GENERATOR WITH A TRANSMITTER END-KEY GENERATOR

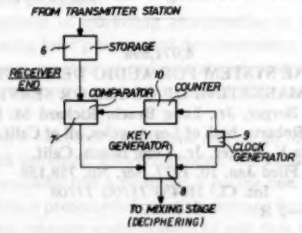
Peter Frutiger, Wangen, Switzerland, assignor to Anstalt Europaische Handelsgesellschaft, Vaduz, Liechtenstein

Filed Jan. 27, 1976, Ser. No. 652,757

Claims priority, application Switzerland, Feb. 5, 1975, 1365/75

Int. Cl.² H04L *7/00*

U.S. Cl. 178—69.1 **5 Claims**



1. A method of synchronizing a receiver end-Key Generator with a transmitter end-Key Generator, comprising the steps of:

a. coupling each of the Key Generators with an associated counter such that the counter state of each counter is characteristic of a position of a Key sequence produced by the associated Key Generator;

b. forming each counter state from the preceding counter state in accordance with a predetermined formation principle;

c. transmitting the counter state of the counter of the transmitter end-Key Generator to the receiver end;

d. comparing the thus transmitted counter state with the counter state of the counter of the receiver end-Key Generator;

e. upon determination of a difference between both counter states, forwardly advancing the receiver end-Key Generator until the difference between the counter states is reduced to null;

f. said forwardly advancing step (e) comprising:

i. forwardly advancing in steps the receiver end-Key Generator when the determined difference between the counter states is smaller than a threshold value; and

ii. forwardly advancing the receiver end-Key Generator in jumps encompassing a multiplicity of individual advancing steps when the difference between the counter states exceeds said threshold value;

g. and producing at the receiver end by means of the formation principle for forming the counter states the next successive counter states which are to be expected owing to the received counter states of the transmitter end-counter, comparing such counter states produced at the receiver end with the correspondingly received counter states, and upon determining a difference of the receiver end produced counter state and the correspondingly received counter state determining the correct counter state based upon the majority of the coinciding places of the counter states.

4,071,694

STETHOSCOPE

G. William Pfeiffer, West Lakeland Township, Washington County, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Aug. 31, 1976, Ser. No. 719,099

Int. Cl.² A61B *7/04*

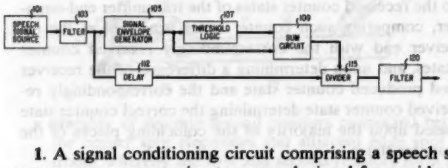
U.S. Cl. 179—1 ST **7 Claims**

1. A combination acoustic and electronic stethoscope comprising a chestpiece having an acoustical transducer for picking up body sounds, a passageway coupling said acoustical transducer to a flexible conduit connected to said chestpiece at one end thereof and being bifurcated at the other end thereof, a pair of earpieces connected to said bifurcated conduit to transmit body sounds picked up by said acoustical transducer for listening by a physician, an electronic amplifier for sound amplification and frequency selection, a speaker located at the bifurcation of said conduit and connected to the output of said electronic amplifier, said chestpiece further including an acousto-electronic transducer connected to the input of said electronic amplifier, a power supply interconnected to said electronic amplifier, means for actuating said electronic amplifier to amplify body sounds picked up by said acousto-electronic transducer, said actuating means simultaneously uncoupling said acoustical transducer from said flexible conduit and isolating said acousto-electronic transducer from the output of said speaker, a volume control and a frequency selector operatively connected to said electronic amplifier, said volume control and frequency selector being operative only when said electronic amplifier is actuated to thereby transmit the amplified body sounds through said speaker and earpieces for listening by a physician, said stethoscope being similar in appearance and size to a conventional acoustic stethoscope and being capable of one-hand operation in either an acoustic mode or an electronic mode.

4,071,695
SPEECH SIGNAL AMPLITUDE EQUALIZER

James Loton Flanagan, Warren, and Susan Anne Webber, North Plainfield, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 12, 1976, Ser. No. 713,930
Int. Cl.[2] H03G 7/00, 11/04
U.S. Cl. 179—1 VL 20 Claims

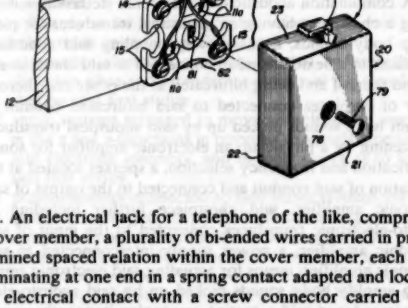


1. A signal conditioning circuit comprising a speech signal source; means responsive to a speech signal from said source for generating a signal representative of the envelope of said speech signal; a first threshold source; a second threshold source, said second threshold being less than said first threshold; means for producing a level signal of first value responsive solely to said envelope representative signal exceeding said first threshold and remaining above said second threshold and of second value responsive solely to said envelope representative signal decreasing below said second threshold and remaining below said first threshold; means for combining said envelope representative signal and said level signal to form a modified envelope signal; and means for dividing said speech signal by said modified envelope signal to produce a substantially unilevel amplitude output signal when said first value level signal is generated and a substantially zero valued output signal when said second value level signal is generated.

4,071,696
TELEPHONE WALL JACK COVER

Bruce W. Anderson, Rosemont, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Apr. 29, 1976, Ser. No. 681,500
Int. Cl.[2] H04M 1/00
U.S. Cl. 179—1 PC 19 Claims

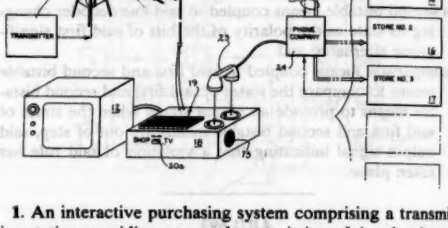


1. An electrical jack for a telephone of the like, comprising a cover member, a plurality of bi-ended wires carried in predetermined spaced relation within the cover member, each wire terminating at one end in a spring contact adapted and located for electrical contact with a screw connector carried on a terminal block, each wire terminating at its other end in a resilient reversely folded spring contact adapted and located for electrical contact with a multi-wire male electrical plug connector, a clip member adapted to mate with the cover member and form a female socket therewith to receive the male multi-wire plug, the clip member including a clip body defining a plurality of wire grooves for receiving said wire reversely folded spring contact ends and for mounting the wires in a fixed, electrically spaced apart relationship, the clip member further including a clip cover means adapted to be secured over the grooves to retain the wires in said relationship, and clip hinge means rotatably interconnecting the clip body and the clip cover to permit the clip cover to be folded over the clip body and retain the wires in and on the clip.

4,071,697
INTERACTIVE VIDEO/TELEPHONE TRANSMISSION SYSTEM

Nolan K. Bushnell, Los Gatos, and Joseph F. Keenan, San Jose, both of Calif., assignors to Atari, Inc., Sunnyvale, Calif.

Filed Oct. 18, 1976, Ser. No. 724,013
Int. Cl.[2] H04M 11/00
U.S. Cl. 179—2 TV 6 Claims

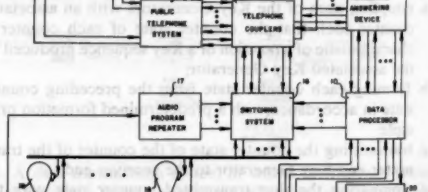


1. An interactive purchasing system comprising a transmitting station providing a general transmission of signals adapted to be received by a plurality of television receivers at viewing stations via a given channel thereof, said signals representing information relating to associated merchandise, telephone coupling means at said viewing stations adapted to cooperate with a telephone in information transfer relation with respect to a selected one of a plurality of stores, means at each viewing station for indicating the selection of merchandise to be purchased, and means operable in response to indicating said selection serving to a request to purchase the selected merchandise, the last named means serving via said telephone to place a call to a store relating to the selected merchandise.

4,071,698
TELEPHONE SYSTEM FOR AUDIO DEMONSTRATION AND MARKETING OF GOODS OR SERVICES

Franklin V. Barger, Jr., Long Beach; Richard M. Knox, and Jefery R. Roberts, both of Los Angeles, all of Calif., assignors to Franklin V. Barger, Jr., Long Beach, Calif.

Filed Jan. 10, 1977, Ser. No. 758,159
Int. Cl.[2] H04M 11/00, 11/08
U.S. Cl. 179—2 R 17 Claims



1. In a system for audio demonstration of merchandise or services offered over a telephone line, the combination comprising

an audio program means having a plurality of channels, one for each prerecorded demonstration,

a data processor for selecting a channel of said repeating means for connection to said telephone line,

switching means responsive to said data processor for connecting a selected channel to said telephone line, and

a plurality of customer service operator terminals selectively connected to said telephone line by said data processor through said switching means.

5. A method of marketing merchandise or services by telephone using brief prerecorded demonstrations stored in an audio program repeater to demonstrate selected merchandise or services to a customer under control of a data processor comprising the steps of

answering a customer's telephone call on an incoming line through automatic answering means and signalling to said data processor that a customer is on the line,

transmitting a prerecorded greeting message from said audio program repeater under control of said data processor to the customer to acknowledge receipt of the call and to instruct the customer what to do next in order to request a selected demonstration,

transmitting a selected demonstration from said audio program repeater to the customer under control of said data processor,

interrupting said data processor when the selected demonstration has been completed for the purpose of transmitting a further communication to the customer, and

transmitting the further communication to the customer as a prerecorded message from said audio program repeater transmitted under control of said data processor to determine whether any other demonstration is to be requested, the customer responding to each prerecorded message with a code entered from a push-button keyboard on the premises of a subscribing retailer, whereby all communications with the customer are automatically controlled by said data processor.

15. A method of marketing merchandise or services by telephone using brief prerecorded demonstrations stored in an audio program repeater to demonstrate selected merchandise or services to a customer under control of a data processor comprising the steps of

answering a customer's telephone call on an incoming line through automatic answering means and signalling to said data processor that a customer is on the line,

transmitting a prerecorded greeting message from said audio program repeater under control of said data processor to the customer to acknowledge receipt of the call and to instruct the customer what to do next in order to request a selected demonstration,

transmitting a selected demonstration from said auido program repeater to the customer under control of said data processor,

interrupting said data processor when the selected demonstration has been completed for the purpose of transmitting a further communication to the customer,

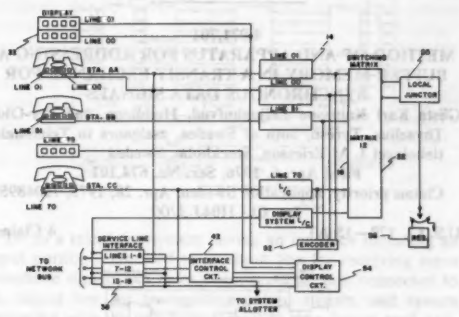
transmitting the further communicatin to the customer as a prerecorded message from said audio program repeater transmitted under control of said data processor to determine whether the customer wishes to order the merchandise or service just demonstrated and whether any other demonstration is to be requested, the customer responding to each prerecorded message transmitted with a code entered from a push-button keyboard on the customer's telephone, whereby all communications with the customer are automatically controlled by said data processor.

4,071,699

APPARATUS PROVIDING FOR THE REMOTE DISPLAY OF CALLING NUMBERS IN A TELEPHONE SYSTEM

Nicola Ljotic Jovic, Chicago, and Steven Allen Rinker, Rosemont, both of Ill., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jan. 30, 1976, Ser. No. 653,711
Int. Cl.[2] H04M *15/06*
U.S. Cl. 179—5.5 11 Claims



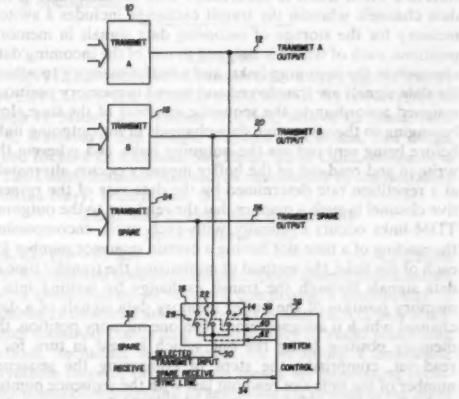
10. A system for displaying the identification number of a calling line, comprising means responsive to sensing of a call directed to a station equipped with a visual display, means for receiving signals representing the identification number of the calling line, means for storing the signals representing the identification number for a selected time period, display means coupled to receive said signals after the selected time period and provide a visual display of said identification number, and means operative at the end of the timed period for completing the call from the calling line to the called line.

4,071,700

TESTING APPARATUS

Charles E. Huffman, Garland; Robert J. McGuire, Richardson, and John W. Waddill, Plano, all of Tex., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 18, 1976, Ser. No. 742,813
Int. Cl.[2] H04J *3/14*
U.S. Cl. 179—15 BF 6 Claims



1. A method of checking operativeness of at least one active transmitter passing a synchronized data stream and at least one spare transmitter using a spare receiver comprising, the steps of:

multiplexing signals in a spare transmitter to provide a synchronized data stream;

cyclically presenting multiplex data outputs from active and spare transmitters to a spare receiver for providing a given logic level output as synchronization is obtained with each data stream; and

cyclically decoding synchronization logic level output results for determining operability of said transmitters and said spare receiver.

4,071,701

METHOD OF AND APPARATUS FOR ADDRESSING A BUFFER MEMORY IN A TRANSIT EXCHANGE FOR SYNCHRONOUS DATA SIGNALS

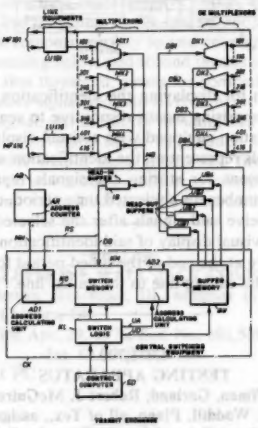
Gösta Karl Knutsson Leijonhufvud, Huddinge, and Per-Olof Thyselius, Tyreso, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Apr. 6, 1976, Ser. No. 674,101

Claims priority, application Sweden, Apr. 28, 1975, 75048959

Int. Cl.² H04J *3/00*

U.S. Cl. 179—15 AT **4 Claims**



1. In a TDM-system having a transit exchange connecting incoming TDM-links to outgoing TDM-links which carry data channels with different data rates having one or more time slots in a TDM-frame in accordance with the data rates of the data channels wherein the transit exchange includes a switch memory for the storage of incoming data signals in memory positions, each of which is assigned to one of the incoming data channels in the incoming links, and a buffer memory to which the data signals are transferred and stored in memory positions assigned according to the sequence numbers of the time slots belonging to the respective data channels in the outgoing links before being sent out via the outgoing links, and wherein the write-in and read-out of the buffer memory occurs alternately at a repetition rate determined by the data rate of the respective channel in such a manner that the read-out to the outgoing TDM-links occurs cyclically with each cycle encompassing the reading of a time slot having a certain sequence number for each of the links, the method of minimizing the transfer time of data signals through the transit exchange by writing into a memory position of the buffer memory data signals of a data channel which is assigned more than one memory position, the memory position being the one which is next in turn for a read-out, comprising the steps of comparing the sequence number of the time slot read out last with the sequence number of the first appropriate time slot in the TDM-frame assigned to the actual data channel whose data signals are being transferred, then if the latter sequence number is higher, writing the data signals of said actual data channel into the memory position which corresponds to said appropriate time slot, if said latter sequence number is lower, comparing said last sequence number with the sequence number of the next appropriate time slot assigned to said actual data channel, repeating said comparing steps until a higher sequence number is found, writing the data signals of said actual data data channel into the memory position of the buffer memory which corresponds to said found higher sequence number, whereas, if the found sequence number of the time slot is equal to the sequence number of the time slot read out last, or if equality has already been found during the comparision of said last sequence number with the sequence number of the first appropriate time slot assigned to said actual data channel determining whether a readout has been made from the memory position corresponding to the sequence number of said first appropriate time slot to the outgoing TDM-link which transfers said actual data channel, said determining comprising comparing the sequence number of said outgoing TDM-link with the sequence number of the TDM-link to which read-out was made last, after which, if the comparision shows that a read-out of said time slot has been made to the TDM-link which transfers said actual data channel, writing the data signals of said actual channel into the memory position which is associated with the next appropriate time slot of said actual channel, while otherwise a write-in is made to the memory position which is associated with the time slot in the process of being read.

4,071,702

TIME DIVISION EXCHANGE AND A METHOD FOR THE RECONFIGURATION OF THIS EXCHANGE

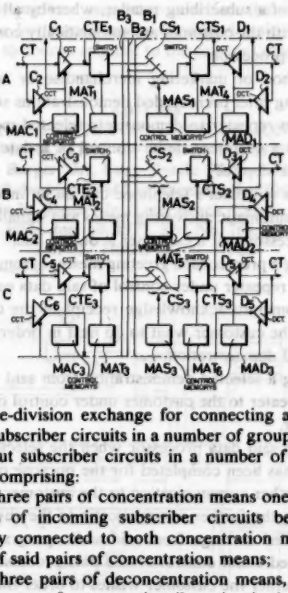
Pierre Charransol; Jacques Hauri, and Serge Fontana, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Feb. 20, 1976, Ser. No. 659,631

Claims priority, application France, Feb. 25, 1975, 75 05799

Int. Cl.² H04Q *11/04*

U.S. Cl. 179—15 AT **4 Claims**



1. A time-division exchange for connecting a plurality of incoming subscriber circuits in a number of groups to a plurality of output subscriber circuits in a number of groups, said exchange comprising:

at least three pairs of concentration means one each of said groups of incoming subscriber circuits being simultaneously connected to both concentration means of one each of said pairs of concentration means;

at least three pairs of deconcentration means, one each of said groups of output subscriber circuits being simultaneously connected to both deconcentration means of one each of said pairs of deconcentration means;

at least three interconnected switching means one each of said switching means being simultaneously connected to a first concentration means of one each of said pairs of concentration means, to a second concentration means of

a different one each of said pairs of concentration means, to a first deconcentration means of one each of said pairs of deconcentration means, and to a second deconcentration means of a different one each of said pairs of deconcentration means;

at least three concentration control means, each of said concentration control means being connected to said first and second concentration means so as to share the load in the event part of said exchange becomes inoperative; and

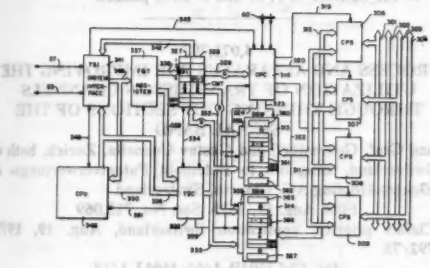
at least three deconcentration control means, each of said deconcentration control means being connected to said first and second deconcentration means so as to share the load in the event part of said exchange becomes inoperative.

4,071,703

TIME SLOT INTERCHANGER

Craig Schaffter, Sunnyvale, Calif., assignor to TRW, Inc., Los Angeles, Calif.

Filed Jan. 26, 1977, Ser. No. 762,811
Int. Cl.² H04Q *11/04*
U.S. Cl. 179—15 AQ **7 Claims**



1. In a telephone system operating in time frames each consisting of a plurality of time slots, a time slot interchanger for connecting data samples between locations in the telephone system comprising:

first and second data memory means for storing and transmitting data samples where each memory means includes a number of separate data stores corresponding to time slots,

a number of cross point switches,

a first data bus for connecting data between said first memory means and a first one of said cross point switches,

a second data bus for connecting data samples between said second memory means and a second one of said cross point switches,

a number of third data buses connected between one of said cross point switches and a different one of said locations,

channel memory means having a plurality of control stores, selected ones of said control stores corresponding to selected ones of said data stores for storing instruction addesses comprising selected data store addresses for addressing said selected ones of said data stores and comprising selected cross point switch addresses,

cross point control means for controlling the connection of said first and second buses to said cross point switches in response to said cross point switch addresses,

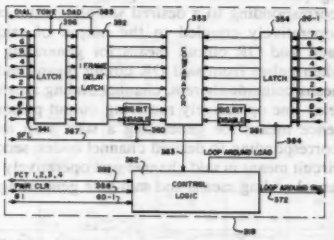
and time slot counter means for addressing said channel memory means, said counter means including means for alternately addressing said first and second data memory means in successive time frames whereby said first and second memory means are alternately addressed by said channel memory means and said counter means.

4,071,704

SERVICE GENERATOR CHECKING APPARATUS

Johannes A. R. Moed, San Jose, Calif., assignor to TRW, Inc., Los Angeles, Calif.

Filed Jan. 26, 1977, Ser. No. 762,808
Int. Cl.² H04M *3/46*
U.S. Cl. 179—15 BF **20 Claims**



19. In a telephone system having an interface including an input portion connected to an input line for receiving input telephone signals and having an output portion connected to an output line for transmitting output signals, said system operating with the telephone signals in time frames each consisting of a plurality of time slots, service generator checking apparatus comprising:

tone generator means for generating, each time frame, pulse code modulated tone samples for a selected tone,

matrix means, connected to receive said selected tone sample, for connecting said selected tone samples to a selected one of said time slots in each frame to form a tone sample signal,

control means, connected to control said matrix means, for specifying said selected tone sample and for specifying said selected one of said time slots,

store means, connected to said matrix means, for storing said tone sample signal,

first connection means for connecting said tone sample signal as an input to said output portion whereby said tone sample signal becomes an output signal,

means for connecting said output signal as an input to said input portion whereby said input signal becomes a check signal corresponding to said tone sample signal,

and comparator means connected to said store means and said input portion for comparing the stored sample signal with the check signal thereby verifying that said interface is operational.

4,071,705

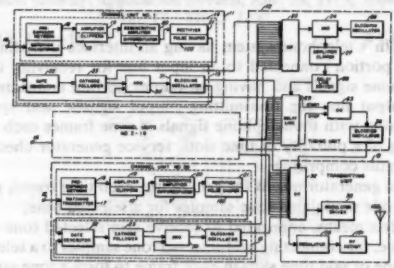
QUANTIZED NON-SYNCHRONOUS CLIPPED SPEECH MULTI-CHANNEL CODED COMMUNICATION SYSTEM

Ralph H. Miller, Jr.; William W. Dyer, both of La Mesa; John A. Waterbury, San Diego; Wayland A. Carlson, San Diego, and Richard O. Eastman, San Diego, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 3, 1961, Ser. No. 107,591
Int. Cl.² H04J *3/00*
U.S. Cl. 179—15 BA **12 Claims**

1. A quantized nonsynchronous clipped speech multichannel coded communications network comprising a multiplicity of transmitter terminals and receiver terminals; each of said transmitter terminals comprising a multiplicity of audio processing sections, including input means for coupling a composite waveform thereto, pre-emphasis means for generating crossover points corresponding to amplitude excursions in the input composite waveform, clipper means operatively receiving the output of said pre-emphasis means for infinitely clipping the composite waveform thereby removing the amplitude portion and leaving the frequency information, pulse generating means operatively coupled to the output of said clipper means and

receiving the output of said clipper means for generating output pulses corresponding to the zero crossover points in the infinitely clipped waveform; a multiplicity of encoding sections corresponding to the audio processing sections, including gate generator means operatively receiving the output of said pulse generating means for generating gate pulses corresponding to said output pulses; a timing unit including, OR circuit means operatively coupled to said gate generating means and receiving pulses therefrom, sampling means for generating pulses corresponding to a desired sampling rate, coincidence means operatively coupled to the output of said sampling means and said OR circuit means for generating an output pulse when pulses from said OR circuit means and said sampling means coincide therein, channel coding means comprising a delay line operatively receiving output pulses from said coincidence means for generating a start stop and channel pulses corresponding to desired channel codes; second coincidence circuit means in said channel unit operatively coupled to said channel coding means and said gate generating means for



generating an output pulse when pulses from said gate generating means and said channel coding means coincide therein; and transmitting means operatively coupled to said channel coder means and said second coincident circuit means for receiving start stop pulses from said channel coding means and output pulses from said second coincidence circuit means corresponding to channel codes and propagating pulse trains therefrom; each of said receiver terminals comprising; receiver means for receiving and detecting trains of pulses; channel decoder means for receiving said detected pulse trains, a multiplicity of channel coincidence means operatively coupled to the output of said channel decoder means for generating an output pulse when start stop and channel pulses are coincident therein; audio restorer means corresponding to said channel coincidence means including, flip-flop means operatively receiving output pulses from said channel coincidence means for generating a substantially square waveform in the output thereof, and integrator means receiving the output of said flip-flop and producing a waveform therefrom approximating said original composite waveform.

4,071,706

DATA PACKETS DISTRIBUTION LOOP

Charles Stewart Warren, Southbourgh, Mass., assignor to RCA Corporation, New York, N.Y.

Filed Sept. 13, 1976, Ser. No. 722,583

Int. Cl.[2] H04J *3/06*

U.S. Cl. 179—15 AL **10 Claims**

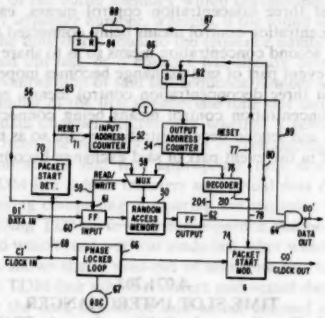
1. A synchronizer for inclusion in a data communications system loop in which packets of N information bits circulate together with clock pulses and packet-start pulses in a loop having S stations each of which introduces a delay corresponding with the time of *n* clock pulses, comprising

a random access memory,

an input address counter means counting to N, incremented by each clock pulse and reset by each packet-start pulse, to store successive information bits in successive memory locations, and

an output address counter means, incremented by each clock pulse and reset upon reaching a count equal to the number N of bits in the packet, to read out information bits successively from successive memory locations,

whereby the contents of said address counters differ by an amount *d* so that the memory introduces a delay equal to



d clock pulses, which, when added to the number *n* times S of clock pulse delays introduced by the S stations connected in the loop, is an integral multiple, including unity, of the number of N of bits in each packet.

4,071,707

PROCESS AND APPARATUS FOR IMPROVING THE UTILIZATION OF TRANSMISSON CHANNELS THROUGH THINNING OUT SECTIONS OF THE SIGNAL BAND

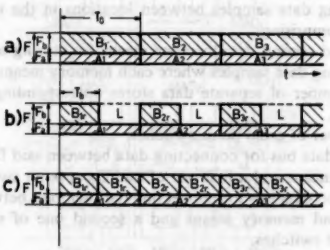
Alban Graf, Gebenstorf, and Gustav Guanella, Zurich, both of Switzerland, assignors to Patelhold Patentverwertungs- & Elektro-Holding AG, Glaurus, Switzerland

Filed Aug. 17, 1976, Ser. No. 715,069

Claims priority, application Switzerland, Aug. 19, 1975, 10792/75

Int. Cl.[2] H04B *1/66;* **H04J** *3/18*

U.S. Cl. 179—15.55 R **15 Claims**



1. In the process for improving the utilization of transmission channels for audio signals as speech or music by which process the sound signals are divided into segments of definite length of which only a reduced part is transmitted and on reception the gaps in the reduced signal are again filled by a repetition thereof so that signals result which are at least partially understandable whereby the gaps produced in the signal transmitted can be employed for transmitting additional signals, the improvement comprising splitting the audio signal to be transmitted into at least two frequency bands including a lower frequency subband and a higher frequency subband, the lower frequency subband having a width from about 300 Hz to about 1100 Hz, transmitting the lower frequency subband in its entirety, periodically interrupting the higher frequency subband to produce short subband segments of 20–50 milliseconds length containing gaps of a time length at least equal to said

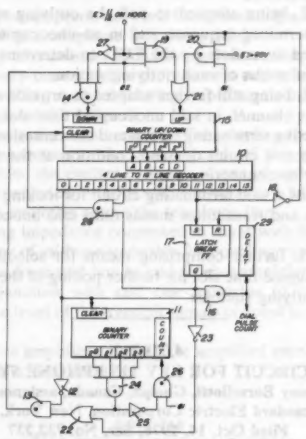
segments therebetween for transmission, and, at the receiving end, reproducing the lower frequency subband and the segments of the gapped higher frequency subband and filling in the gaps in the higher frequency subband by repetition of the adjacent segments.

4,071,708

DIAL PULSE DETECTOR

Murray L. Kaplan, Cherry Hill; Terry N. Herbster, Willingboro, and Alan F. Holden, Medford, all of N.J., assignors to Telesciences, Inc., Moorestown, N.J.

Filed Nov. 11, 1976, Ser. No. 741,047
Int. Cl.² H04G *1/36*
U.S. Cl. 179—16 E **35 Claims**



1. Apparatus for detecting the occurrence of dial pulses on telephone lines in the presence of severe signal distortions due to line conditions, comprising in combination,

a. first means responsive to the occurrence of a first signal level greater than a first selected threshold level to generate first count signals at regularly occurring spaced time intervals during the continuance of said first signal level,

b. second means responsive to the occurrence of a second signal level less than said first selected threshold level to generate second count signals at regularly occurring spaced time intervals during the continuance of said second signal level,

c. up/down counting means having input and output means,

1. said first means being coupled to a part of said counting means input means and causing an up-count for each said first count signal,

2. said second means being coupled to a part of said counting means input means and causing a down-count for each said second count signal,

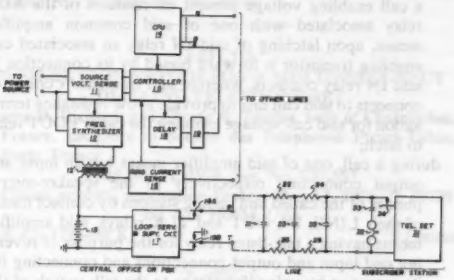
d. count signals interpreting means coupled to said counting means output means responsive to the detection of a selected up-count by said counting means followed by the detection of a selected down-count by said counting means to generate a dial pulse count signal designating that a valid dial pulse has been detected.

4,071,709

LINE CONDITIONING AND TRANSFER CIRCUIT

David Quon Lee, Chicago, and Richard Michael Rovnyak, Schaumburg, both of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Dec. 16, 1976, Ser. No. 751,287
Int. Cl.² H04M *3/04*
U.S. Cl. 179—18 HB **7 Claims**



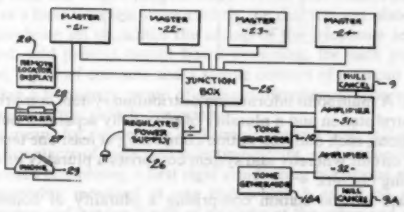
1. A telephone system including, a telephone line connected to at least one subscriber station including a ringer; a central switching system including a central processor unit, line supervisory means, and line relay means connected to said central processor unit normally connecting said line to said line supervisory means, and a ringing signal generator connectable to a power source; the improvement comprising: voltage sensing means connected between said ringing signal generator and said power source; and a control circuit including circuit connections to said line relay, to said voltage sensing means and to said central processor unit, initially operated in response to said central processor unit to connect said power source to said ringing signal generator through said voltage sensing means and to operate said line relay, whereby ringing current from said ringing signal generator is connected to said telephone line to operate said subscriber station ringer.

4,071,710

COMMUNICATION-RECORDER SYSTEM

Roy Burnett, 29341 Hillrise Drive, Agoura, Calif. 91301

Filed Nov. 5, 1975, Ser. No. 629,034
Int. Cl.² H04M *9/06*
U.S. Cl. 179—37 **8 Claims**



1. An intercom system with a plurality of master stations which can be selectively operated to intercommunicate with one another, each station containing call generating means, station selecting means, a LINE, AUTO, IN, OUT and TLK relays, a common call line from each station to each of the other stations, a call enabling transistor and speaker-microphone means, and a talk switch;

plural common amplifier means each associated with a separate talk-listen relay and a separate ACT relay;

each call generating means comprising a pair of transistors in a monostable multivibrator configuration receiving a trigger voltage from an SCR connecting to a trigger source in the associated station selecting means, said mul-

tivibrator forward biasing a transistor which places an inhibiting voltage on a line which connects to the call generators of all other stations, said multivibrator also placing a call voltage through its associated OUT relay coil and station selecting means onto the call line connecting to the called station's ANN relay coil of the called stations IN relay, said IN relay latching in the instance where the other end of the said IN relay coil connects to a call enabling voltage present on contacts of the ACT relay associated with one of said common amplifier means, upon latching of said IN relay an associated call enabling transistor is forward biased by its connection to said IN relay contacts, wherein said transistor's collector connects to said call line to provide a low resistance termination for said call voltage enabling the caller's OUT relay to latch;

during a call, one of said amplifier means has an input and output connecting respectively to the speaker-microphones of the called and calling stations by contact means of their LINE, IN, OUT and TLK relays, said amplifier means having a talk-listen relay for the purpose of reversing said input and output connections and connecting for its actuation by voice line means to the talk switch of the calling station, each amplifier means having an ACT relay for the purpose of providing for proper amplifier availability.

4,071,711

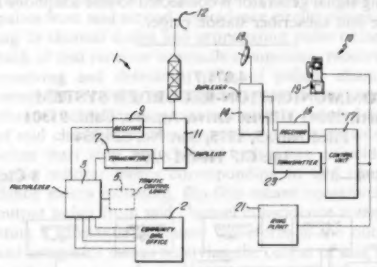
TELEPHONE SUBSCRIBER DISTRIBUTION SYSTEM

Donald M. Beaupre, Beaconsfield, and Harold A. Ferris, St. Eugene, both of Canada, assignors to Farinon Electric of Canada Ltd., Montreal, Canada

Continuation-in-part of Ser. No. 494,305, Aug. 2, 1974. This application June 20, 1975, Ser. No. 588,691

Int. Cl.[2] H04J *3/12*

U.S. Cl. 179—41 A **14 Claims**



1. A multipoint information distribution system comprising a central station and a plurality of physically separated outlying stations, each outlying station comprising at least one terminating circuit whereby said system comprises a plurality of terminating circuits;

said central station comprising a plurality of connecting ports equal in number to the plurality of terminating circuits;

and means for coupling selected ones of said terminating circuits to selected ones of said connecting ports one at a time;

characterized in that said coupling means comprises

means including a multiplexer means at said central station for time sampling contents of said connecting ports in an ordered sequence during cyclically recurring time slots to provide, at an output of said multiplexer means, a first sequentially ordered sample stream;

transmission means at said central station for sending said sample stream directly and in common to each outlying station on a first medium whereby identical sample streams are sent to each outlying station;

receiving means at each outlying station adapted to receive said sample streams;

control means at each outlying station coupled to said receiving means to permit only samples in preselected time slots to be applied to selected terminating circuits at said outlying station;

transmission means at each said outlying station; and

means for providing a signal to said transmission means;

said control means comprising means for gating said transmission means only during the preselected time slots of their respective terminating circuits to thereby provide samples of said signal, whereby each outlying station transmits, on a second medium, samples of the signal provided to their respective transmission means;

said outlying stations comprising means for arranging the transmission time slots at each station relative to one another so that samples will arrive at a receiving means of the central station in a second sequentially ordered sample stream;

distributor means comprising a demultiplexer means at said central station connected to an output of said receiving means and adapted to distribute said time distributed samples into their respective connecting ports;

said central station further comprising traffic control logic (TCL) means;

said TCL being adapted to poll the outlying stations in a predetermined sequence and in an unoccupied time slot selected at random by the TCL, to determine the circuit demand status of each outlying station;

said TCL being still further adapted to provide a communications channel, in said unoccupied time slot, between a respective terminating circuit and the central station when it detects a circuit demand condition at the terminating circuit or connecting port;

and means at said terminating circuit for locking its receiver means and transmitter means onto said unoccupied time slot;

said TCL further comprising means for selecting another unoccupied time slot for further polling of the uncommitted outlying stations.

4,071,712

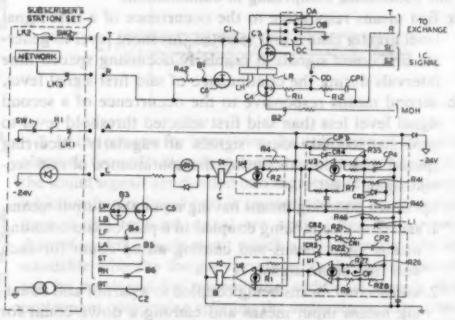
LINE CIRCUIT FOR KEY TELEPHONE SYSTEMS

John Anthony Barsellotti, Guelph, Canada, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Oct. 14, 1976, Ser. No. 732,237

Int. Cl.[2] H04M *1/00*

U.S. Cl. 179—99 **7 Claims**



1. A line circuit for controlling a line of a key telephone system, including a first and a second relay for producing output signaling conditions of said line circuit; relay operating logic including a first and a second operational amplifier, ring detecting means responsive to ringing signals applied to said line for switching a first of said amplifiers to an operative condition for causing energization of said first relay, means

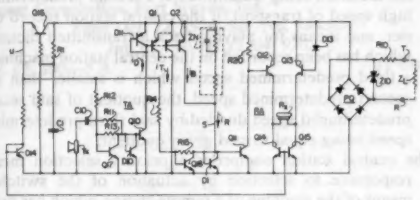
responsive to a hold signal applied to said line for switching said second amplifier to an operative condition to energize both said first and second relays, and means operative in response to a closed loop on said line for energizing said second relay independently of said amplifiers.

4,071,713

TELEPHONE SPEECH NETWORK

Mevhibe Gulay Sencer, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Dec. 27, 1976, Ser. No. 754,430
Int. Cl.² H04M *1/58*
U.S. Cl. 179—81 A **4 Claims**



1. A telephone speech network for connecting a transmitter and receiver to a telephone line, comprising:

a plurality of transistors each having their emitter-collectors effectively connected in shunt across said telephone line for providing a signal varying impedance across the line terminals of the network;

a line powered transmit amplifier for coupling the output of said transmitter to the base of each of the plurality of transistors, the emitter-collector of one of said transistors being connected in series with the input to a line powered receive amplifier across the telephone line;

a balancing impedance connected in shunt with the emitter-collector of said one transistor for coupling receive signal currents from said line to said receive amplifier input and in conjunction with said one transistor to control the sidetone level of the transmit signals coupled to said input; and

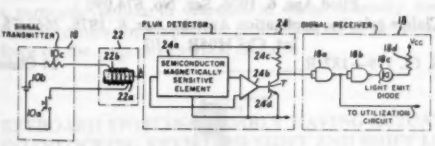
said receive amplifier coupling the amplified received signal currents to said receiver.

4,071,714

SIGNAL TRANSMISSION SYSTEM

Tsuyoshi Satoh, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed June 20, 1975, Ser. No. 588,722
Claims priority, application Japan, June 26, 1974, 49-73590
Int. Cl.² H04B *13/00*
U.S. Cl. 179—82 **5 Claims**



2. A signal transmission system, comprising: magnetic flux transmitting means receptive in use of at least one DC electrical signal for transmitting a corresponding DC magnetic flux a signal in response to said DC electrical signal, and magnetic flux detecting means spaced from said magnetic flux transmitting means for magnetically coupling therewith and comprising a semiconductor element responsive to DC magnetic flux for detecting the transmitted DC magnetic flux signal and for developing an output electrical signal corresponding to the transmitted DC magnetic flux signal; wherein said magnetic flux transmitting means comprises a magnetic core; a coil having an inductance and wound around said core and being energizable by said DC electrical signal for developing a magnetic flux in said core and in a region of space beyond said core; and a resistor connected in series with said coil, said resistor having a resistance value selected in accordance with the inductance value of said coil to jointly define with said coil a filter to filter electrical noise from said DC electrical signal applied to said coil and prevent a noise component in said transmitted DC magnetic flux signal.

4,071,715

PUSH-BUTTON SWITCH FOR A MULTIFREQUENCY DIALLING TELEPHONE SET

Pierre D. Richard, and Claude R. Tessier, both of Chateaudun, France, assignors to Societe des Telephones Picart Lebas, Paris, France

Filed Nov. 1, 1976, Ser. No. 737,557
Claims priority, application France, Dec. 17, 1975, 75 38739
Int. Cl.² H04M *1/50*
U.S. Cl. 179—90 K **8 Claims**

1. A push-button switch device for a multifrequency dialling telephone set which is provided with a multifrequency generator having a first terminal connected to a first wire of a telephone line, and with a printed board for the electronic switch parts as a base which is supported on the dial support plate of the telephone set on which the casing of the telephone set is secured, said printed circuit board providing, for each push-button, a pair of contacts and a simple contact of a circuit for selecting a frequency group of said multifrequency generator, said push-button switch comprising:

first means for connecting said simple contact with said pair of contacts of each said selecting circuit, said connecting means comprising a first rigid conducting horizontal reed pivotably mounted at one end which is tilted on said casing and having a pair of contacts at the other end and a simple contact between said ends, said simple contact and said pair of contacts of said first reed not being in contact with said selection circuit when vertical pressure is exerted on said push-button;

second means for connecting a second terminal of said multifrequency generator to a second wire of said telephone line, said connecting means comprising second and third rigid conducting right-angle reeds on said circuit board rotably mounted at one of their ends which are respectively connected by windings to said second wire of said telephone line and to said second terminal of said multifrequency generator, the other ends of said second and third reeds being movable and not being in contact when vertical pressure is exerted on said push-button, and a fourth

flexible conducting right-angle reed fixed at one of its ends on said circuit board which is connected to said first wire of said telephone line, the other end of said fourth flexible reed being free and being in contact with said movable end of said second rigid reed when pressure is exerted on said push-button; and mechanical means comprising first and second springs, the upward stress of said first spring being greater than the downward stress of said second spring and directed against the said downward stress of said second spring and said vertical pressure exerted downwardly on said push-button, and long draw coil springs for releasing said movable ends of said second and third reeds having downward stresses much smaller than said upward stress of said first spring, the downward stroke of said push-button comprising two consecutive phases, namely:

a first phase during which said pressure exerted on said push-button is directed against the differential force of said stresses of said first and second springs so that said second terminal of said multifrequency generator is disconnected from said second wire of said telephone line and at the end of which said selection circuit of said frequency group is connected to said multifrequency generator for selecting said frequency group; and

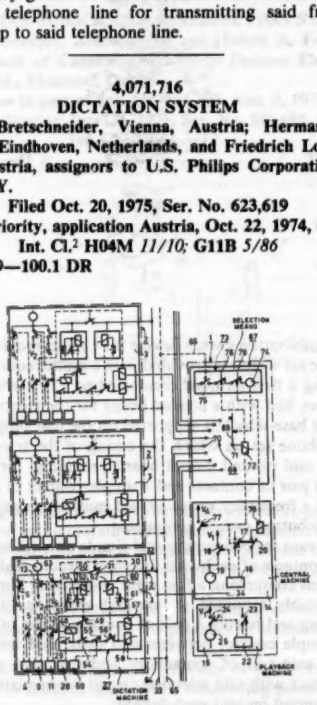
a second phase during which said pressure exerted on said push-button is only directed against said upward stress of said first spring, so that after the beginning of said second phase said second terminal of said multifrequency generator is connected to said second wire of said telephone line for transmitting said frequency group to said telephone line.

4,071,716

DICTATION SYSTEM

Hermann Bretschneider, Vienna, Austria; Herman Pieter Hueber, Eindhoven, Netherlands, and Friedrich Louzil, Vienna, Austria, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 20, 1975, Ser. No. 623,619
Claims priority, application Austria, Oct. 22, 1974, 8492/74
Int. Cl.[2] H04M *11/10*; G11B *5/86*
U.S. Cl. 179—100.1 DR **4 Claims**



1. A dictation system comprising a multiplicity of remote stations and one central station which can be selected by said remote stations and which comprises at least one recording and playback machine, which remote stations can optionally be connected to the central station when said central station is free for the transmission of dictations, wherein

each remote station comprises a recording and playback machine comprising means for recording dictation at a normal speed of transport of a record carrier transport;

said remote station machine includes a switching means for calling the central station and establishing a signal path between the remote station machine and the central station machine for the transmission of the dictation in response to actuation, effected upon completion of a recording procedure, when the central station is not busy;

the remote station machine comprises means for switching on a "playback transmission" mode for playing back recorded dictation at a first predetermined speed of transport of the remote station record carrier, the quotient of said first predetermined speed divided by the normal speed being a given quotient greater than one;

the central station machine comprises means for switching on and off a "recording transmission" mode for recording the dictation being transmitted at a second predetermined high speed of transport of the central station record carrier, and means for playing back a transmitted dictation which has been recorded on the central station machine at a third predetermined speed which is smaller than said second predetermined speed, the quotient of said second predetermined speed divided by said third predetermined speed being equal to said given quotient;

the central station comprises a priority selection means, responsive to selection by actuation of the switching means of the machine of a remote station which has priority over the switching means of the machines of all other calling remote stations, when the central station is engaged, for blocking the switching means of the machines of all other calling remote stations from switching on said "playback transmission" mode; and when the central station is free, for establishing a connection with a machine of one of said all other calling remote stations and unblocking the switching means of the machine of said one selected remote station; each remote station further comprising end stop means for automatically cancelling selected modes of operation of the remote station and clearing the "recording transmission" mode and initiating establishment of another connection by the priority selection means of the central station, upon completion of the transmission of a dictation to be recorded on the central station machine; and

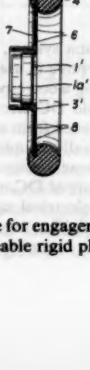
at least one remote station further comprises means, responsive to the switching means of said at least one remote station being actuated and being blocked by said priority selection means, for cancelling the actuation of the switching means of said at least one remote station, in response to changing the record carrier in the machine of said at least one remote station.

4,071,717

HEADPHONE EARPIECE

Werner Fidi, Baden, and Horst Moser, Vienna, both of Austria, assignors to AKG Akustische u. Kino-Gerate Gesellschaft m.b.H., Austria

Filed Apr. 6, 1976, Ser. No. 674,090
Claims priority, application Austria, Apr. 8, 1975, 2643/75
Int. Cl.[2] H04R *1/10*
U.S. Cl. 179—182 R **14 Claims**



1. A headphone earpiece for engagement over a person's ear, comprising a sound permeable rigid plate forming an earpiece

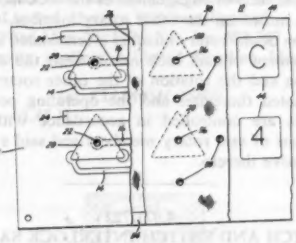
surface having a central opening therethrough, an electro-acoustic transducer located adjacent said plate and supported within the opening by said plate, and an annular resilient pad surrounding and connected to the periphery of said plate, said plate having an acoustic frictional resistance which comprises a mass of acoustic material which is effective particularly in the range of high frequencies.

4,071,718

FLAT KEYBOARD ASSEMBLY HAVING COVER TYPE MEMBRANE WITH PROTRUSIONS TO ALIGN SWITCH COMPONENTS

Phillip L. Harden, Roanoke, Ind., assignor to Bowmar Instrument Corporation, Fort Wayne, Ind.

Filed Oct. 22, 1976, Ser. No. 734,824
Int. Cl.[2] H01H *13/04, 9/02*
U.S. Cl. 200—5 A **11 Claims**



1. A flat, thin keyboard assembly comprising: a relatively thin support member having opposite sides, a plurality of spaced-apart switches supported on one side of said support member, said switches respectively including resilient metallic snap-acting dome elements actuatable from first to second positions in response to force exerted thereon, a switch-actuator member formed of relatively thin flexible material and having opposite sides with one side in facing relationship with said one side of said support member and covering said switch elements, said switchactuator member having thin-walled switch-actuating protrusions formed from a side thereof respectively in alignment with said switch elements and respectively defining corresponding indentations on the opposite side thereof, a flat keyboard member formed of relatively thin flexible material having opposite sides with one side in facing relationship with the side of said actuator member remote from said one side of support member, the other side of said keyboard member having keyboard indicia thereon respectively in alignment with said switch-actuating protrusions and switch elements, and means for holding said members in assembled relation with said switch-actuator member sandwiched between said support member and said keyboard member whereby deflection of said keyboard member in the region of a particular indicia in response to force manually exerted thereon causes the respective protrusions to apply actuating force on the respective switch element.

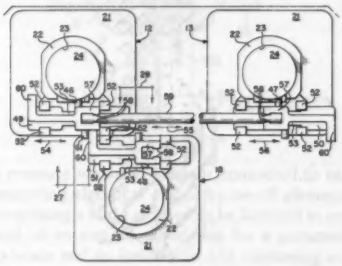
4,071,719

KEYBOARD SWITCH ASSEMBLY HAVING ACTUATOR INTERLOCKING KEYBOARD SHIFT AND SHIFT LOCK AND RELEASE MECHANISM

Robert Christen Madland, Mount Prospect, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed July 22, 1976, Ser. No. 707,742
Int. Cl.[2] H01H *3/20, 9/20;* **G06C** *7/02*
U.S. Cl. 200—5 B **13 Claims**

1. A keyboard mechanism comprising a shift keyswitch and a shift lock keyswitch positioned adjacent said shift keyswitch wherein each of said keyswitches comprises a switching means, a housing for said switching means having an outer surface with an aperture therein, an actuating member having a cam associated therewith mounted for movement into said housing through said aperture from an initial undepressed position to a depressed position for actuating said switching means when said actuating member is in said depressed position, resilient means for returning said actuating member to its undepressed position and a slide member having a cam follower thereon which follows said cam wherein said slide member slides back and forth with respect to said outer surface, and wherein said mechanism further comprises a first engagement means on said slide member of said shift lock keyswitch and a second engagement means on said slide member of said shift keyswitch, which engages said first engagement means such that motion of one of said adjacent slide members causes a corresponding motion of the other of said adjacent slide members, said cam of said shift keyswitch being constructed to



allow for independent depression of said actuating member of said shift keyswitch when said actuating member of said shift lock keyswitch is undepressed and said cam of said shift lock keyswitch being constructed so as to lock said actuating member of said shift lock keyswitch in a depressed position upon a first depression of said actuating member of said shift lock keyswitch so that said switching means of said shift lock keyswitch thereby is maintained actuated, said cams of said shift and shift lock keyswitches being further constructed such that a subsequent depression of said actuating member of said shift keyswitch causes said actuating member of said shift lock keyswitch to be released from its locked depressed position and returned to its initial position thereby deactuating said switching means of said shift lock keyswitch.

4,071,720

BINARY CODED CAM SELECTOR SWITCH HAVING SPLIT HOUSING AND DENT STRUCTURE

Gary Edward Krajci, Antioch, and John Joseph Marrella, Broadview, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed June 17, 1976, Ser. No. 697,092
Int. Cl.[2] H01H *19/00;* **G05G** *5/06*
U.S. Cl. 200—6 B **12 Claims**

1. A binary coded cam selector switch assembly comprising in combination:

a rotary member molded of an abrasion resistant plastic and including integrally, axially displaced multiple coaxial cam surfaces, cylindrical bearing surfaces, a first detent member, and a control shaft;

two rigid metal contact bars;

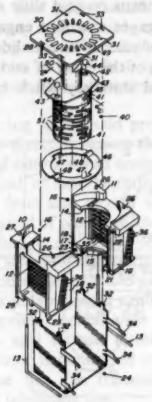
a plurality of resilient metal contacts individually movable by contact with portions of the cam surfaces from a normal position free of the contact bars into sliding contact with said bars;

a metal detent plate supported on the control shaft of the rotary member and axially displaced from the first detent member;

two spherical metal detent elements, retained between the first detent member of the rotary member and the metal detent plate for cooperating with said plate and said mem-

ber to position the cam surfaces at ones of a number of predetermined positions relative to said metal contacts;

two mating housing portions, molded of an abrasion resistant plastic, and including boss means having at least two different diameters, semi-cylindrical bearing surfaces, for cooperating with the cylindrical bearing surfaces of the rotary member, and each portion fixedly retaining one of the metal contact bars and a predetermined number of the metal contacts;



a metal housing clamp adapted to cooperate with the metal detent plate for retaining the housing portions in a tightly mated relationship, and including first tab means for retaining the metal detent plate and second tab means for mounting the switch assembly, and the metal detent plate having first apertures adapted to receive the boss means of the housing portions for proper orientation of the detent plate relative to the housing portions and second apertures adapted to receive the first tab means of the housing clamp only when the ends of the clamp are stressed toward each other.

4,071,721

SEQUENTIAL CONTROLLER

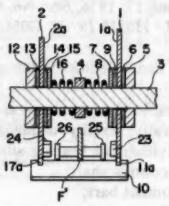
Tomoji Murata; Yoshihiro Nakamura, both of Toyokawa; Kenji Shibazaki, Aichi, and Matsuo Kuse, Toyokawa, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 23, 1976, Ser. No. 660,405

Claims priority, application Japan, Mar. 8, 1975, 50-28413

Int. Cl.[2] H01H *43/10*

U.S. Cl. 200—38 B **13 Claims**



1. A sequential controller for use in an apparatus provided with a plurality of devices for controlling the operating periods of each of the devices, comprising:

a. at least first and second rotary members rotatably supported on a common axis and each having detent means thereon with said first rotary member having at least two detent means and the detent means on said second rotary member is different from the detent means on said first rotary member;

a. ' at least first and second switch means responsive to rotation of the corresponding one of said rotary members for controlling operating periods of a corresponding device;

b. a driving means for driving the rotary members, and friction means provided between the driving means and the rotary members through which the driving force is transmitted to the rotary members;

c. lock means urged against said rotary members and engageable with said detent means for preventing the rotary members from rotating and disengageable from said detent means for freeing said rotary members to be rotated by said driving means; and

d. a single disengaging means associated with said lock means for disengaging said lock means from said detent means for a time sufficient to free all of said rotary members for rotation and then for causing said lock means to re-engage with said rotary members for engaging the detent means on one rotary member at a time different from the time of engagement of the lock means with the detent means on the other rotary member, whereby the rotation of one rotary member is terminated earlier by the engagement of said lock means with the detent means thereon and the rotation of the other rotary member is terminated thereafter and the operating periods of the devices are controlled in accordance with respective rotations of said rotary members and said switch means responsive thereto.

4,071,722

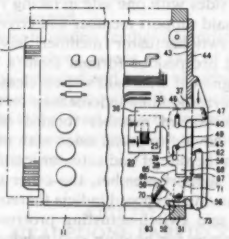
LATCH AND SWITCH INTERLOCK SAFETY STRUCTURE

Terry Jonathan Hart, Long Valley, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 31, 1976, Ser. No. 719,260

Int. Cl.[2] H01H *9/20*

U.S. Cl. 200—50 A **10 Claims**



1. A switch assembly for removing electrical power supplied to an electronic module during insertion and removal of the module with a mating connector on a support frame including

a switch fixedly mounted to said module and having a slidable member movable from a first position, wherein said switch is in an OFF state preventing electrical power from being supplied to said module, to a second position, wherein said switch is in an ON state permitting electrical power to be supplied to said module,

means for imparting a positional bias to said switch, said positional bias tending to maintain said switch in its OFF state,

a generally T-shaped member for overriding said positional bias and actuating said switch when said module is mated with said connector on said support frame, said T-shaped member having a first arm for engaging said slidable member and a second arm having means integral therewith to facilitate imparting a slidable motion to said T-shaped member, said member further having a stem portion which has first and second spaced-apart elongated apertures axially displaced from one another along an axis of said stem for guiding said T-shaped member during said

slidable motion, said T-shaped member further including means for holding said switch in its ON state upon actuation,

first and second pins affixed to said module, said pins slidably engaging said first and second elongated apertures, and

means, pivotally mounted on said module, for latching said module to said support frame, said latching means including means for engaging said T-shaped member so that upon insertion and removal of said module said latching means is pivotally rotated imparting an arcuate motion to said T-shaped member releasing said holding means and allowing said positional bias to return said switch to its OFF state.

4,071,723

PLUNGER-RELEASE SHOCK RESPONSIVE CONTROL APPARATUS HAVING ADJUSTABLE SEAT FOR SENSOR MASS

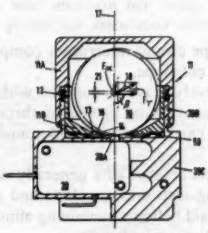
Peter Ronald Jackman, Basingstoke, England, assignor to Inertia Switch Limited, Hartley Wintney, England

Filed May 20, 1976, Ser. No. 688,337

Claims priority, application United Kingdom, May 13, 1975, 20161/75

Int. Cl.[2] H01H *35/00*

U.S. Cl. 200—61.45 R **3 Claims**



1. A plunger-release, shock-responsive control apparatus comprising:

a first housing having an upper wall, which is formed with a plunger aperture, and an external annular-section projection surrounding said aperture and extending vertically along a central axis passing through the plunger aperture;

a second housing having a cup member, which is axially movable in the annular-section projection and defines a coaxial concave seat of circular cross-section, and having a cover which is directed away from said upper wall;

screw-threaded means connecting the cover to the annular projection for moving the cup member relative to the first housing so as to effect vertical adjustment of the concave seat;

a two-mode control device operable, in different modes, to perform two different control functions and having a plunger which is axially aligned with said aperture and is operable, on actuating movement along the central axis between a depressed position and an elevated position, to effect a change of mode of said control device; and

a seismic roller, accommodated in the concave seat, above the plunger, for lateral movement, as a result of a predetermined variation of the resultant of all forces acting on the roller, from a rest position on the central axis where the weight of the roller prevents movement of the plunger from the depressed position to the elevated position, so as to allow the plunger to move to its elevated position;

the seat defining a concave surface extending from said central axis and including a region which is engaged by the seismic roller during said lateral movement from its rest position and at which region there is an increase in the inclination of the surface of the seat to said central axis so that, in the axial plane of lateral movement of the roller the increased inclination is greater than the inclination of the tangent to the roller at the point of contact between the roller and the seat when the roller is in its rest position.

4,071,724

TIRE PRESSURE VARIATION DETECTOR

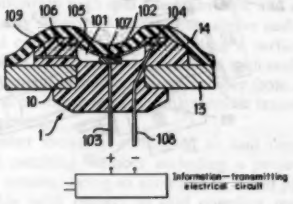
Daniel Lejeune, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, France

Filed Apr. 20, 1976, Ser. No. 678,617

Claims priority, application France, Apr. 21, 1975, 75 12433

Int. Cl.[2] B60C *23/04;* H01H *35/24*

U.S. Cl. 200—61.25 **5 Claims**



1. A tire pressure variation detector connected to an information-transmitting electrical circuit by on-off elements, said detector comprising a body adapted to be fastened in an opening of a wall of an airtight wheel rim for a pneumatic tire having two beads and an inside wall and containing an inner tube having an outside wall, said wall of the wheel rim extending between the two beads of the tire, said body comprising a portion intended to enter into contact with the inner tube and having a stiff elastic element bearing a movable electrical contact intended to enter into contact with a stationary electrical contact borne by another portion of said body, the two electrical contacts being electrically insulated from each other and constituting said on-off elements of said information-transmitting electrical circuit, the stiffness of the elastic element being such that the two electrical contacts touch each other when the inner tube is inflated to normal inflation air pressure and move away from each other when air pressure increases in a space outside the inner tube, said space outside the inner tube being formed by the inside wall of the tire, the outside wall of the inner tube and said wall of the wheel rim, the detector being characterized by the fact that the body is fastened in airtight manner in the opening of the wall of the wheel rim and comprises, in the portion thereof intended to enter into contact with the inner tube, a cavity which contains the stationary electrical contact and which is closed by a flexible airtight diaphragm which serves as the elastic element, said cavity being connected to said space outside the inner tube by a channel provided in the body of the detector.

4,071,725

PROXIMITY SWITCH FOR FLUID CYLINDERS

John L. Smith, Cuyahoga Falls, and Clair B. Alexander, Akron, both of Ohio, assignors to Ibec Industries, Inc., New York, N.Y.

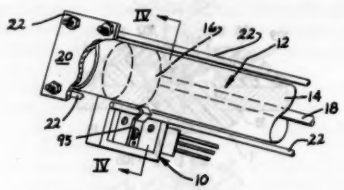
Filed Feb. 27, 1976, Ser. No. 661,951

Int. Cl.[2] H01H *35/38*

U.S. Cl. 200—82 E **24 Claims**

1. A magentic proximity apparatus for use with fluid cylinders of the type including a cylinder, a magnetically attractive piston mounted for movement within the cylinder, and tie rods extending along and spaced outwardly from the exterior surface of the cylinder between support means at the ends of the cylinder, said apparatus comprising a base means supporting said apparatus, switch means secured to said base means for completing an electrical circuit; actuator means for closing said switch means in response to the proximity of a piston of a fluid cylinder, said actuator means including a magnet, means for movably supporting said magnet, and means for engaging

said switch means; said magnet adapted to be attracted toward a fluid cylinder piston when the piston is in proximity to the magnet to move said engaging means to close said switch means; and clamping means securing said apparatus to one of the tie rods of the fluid cylinder, which tie rod is spaced outwardly therefrom, such that said magnet is positioned closely adjacent to and approximately tangentially to the fluid cylinder; said clamping means including a clamping arm having two ends and spacer means extending between one end of said clamping arm and said base means for spacing said one end of



said clamping arm from said base means, said spacer means including a body having a first portion received in a portion of said base means and a second portion received in a portion of said one end of said clamping arm at a position spaced from the other end of said clamping arm; and tightening means extending between said clamping arm and base means and positioned intermediate said body and said other end of said clamping arm for tightening said clamping arm toward said base means to securely clamp the tie rod between said clamping arm and base means.

4,071,726

ELECTRICAL SWITCH HAVING ACTUATOR LIGHT TRANSMISSIVE REGION, INTERMEDIATE LENS AND LIGHT SOURCE

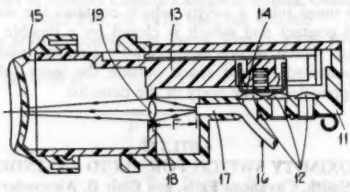
Konrad Werda, Clitheroe, England, assignor to Lucas Electrical Company, Limited, England

Filed Jan. 29, 1976, Ser. No. 653,603

Claims priority, application United Kingdom, Feb. 11, 1975, 5711/75

Int. Cl.² H01H 9/16; G09F 9/00

U.S. Cl. 200—311 **4 Claims**



3. An electrical switch assembly having indicator means comprising:

a body;

an operating member, mounted in said body, for movement relative thereto between first and second spaced positions;

a light transmissive region, located in said operating member, visible in both of said first and second operative positions;

light source means for emitting light and illuminating said light transmissive region;

lens means, disposed between said light source means and said light transmissive region and responsive to the distance from said light source means, for modifying the light illuminating said light transmissive region into varying levels of exposure area on said light transmissive region, said operating member further varying said distance between said light source means and said lens means.

4,071,727

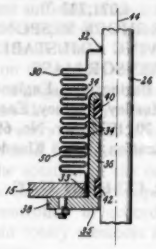
VACUUM-TYPE CIRCUIT INTERRUPTER WITH MEANS FOR PROTECTING ITS BELLOWS AGAINST MECHANICAL DAMAGE

Donald Wayne Crouch, Newtown Square, and Robert Wayne Nelson, Broomall, both of Pa., assignors to General Electric Company, Philadelphia, Pa.

Filed May 6, 1976, Ser. No. 683,869

Int. Cl.² H01H 33/66

U.S. Cl. 200—144 B **7 Claims**



1. A vacuum-type circuit interrupter comprising:

a. an evacuated envelope,

b. a pair of relatively movable contacts within said envelope,

c. a conductive contact rod projecting through a wall of said envelope and carrying one of said contacts at one end of the rod,

d. a flexible metal bellows of a generally tubular configuration projecting into said envelope and surrounding said contact rod, said bellows containing annular convolutions axially-spaced along its length,

e. means for joining the inner end of said bellows to said contact rod and for joining the outer end of said bellows to said envelope wall,

f. a guide for said contact rod comprising a tubular metal sleeve surrounding said contact rod, located within said bellows, and fixed to said envelope wall for guiding said rod for axial movement, said sleeve having an inner end wall so located that some of said convolutions are located axially inwardly thereof,

g. means forming a slide bearing disposed between said sleeve and said contact rod, and

h. a coating of self-lubricating plastic material on the outer peripheral surface of said sleeve and on the inner end surface of said sleeve, which coating is sufficiently close to the internal surface of said bellows as to be contacted by said convolutions when said contact rod is axially moved during operation of the interrupter, the lubricating properties of said coating reducing friction between said convolutions and said coated sleeve.

4,071,728

CROSSPOINT SWITCH COMPRISING BISTABLE CROSSPOINTS

Reinhard Cornelis Greve, Baarn, and Cornelis Pieter van Luijk, Hilversum, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 26, 1974, Ser. No. 445,992

Claims priority, application Netherlands, Mar. 15, 1973, 7303599

Int. Cl.² H01H 63/33

U.S. Cl. 200—175 **12 Claims**

1. A crosspoint switch comprising

a number of selection bars having a plurality of engaging

surfaces and a corresponding plurality of disengaging surfaces,

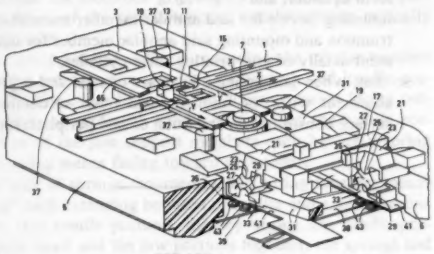
means for mounting said selection bars and for selectively moving said bars between a neutral position and a selection position,

a number of switching bars having a plurality of actuating surfaces and a corresponding plurality of releasing surfaces,

means for mounting said switching bars so as to cross said selection bars, and for selective movement of said switching bars between a neutral position and a switching position, crossings of a selection bar and a switching bar defining a plurality of crosspoints, each crosspoint having associated therewith a corresponding engaging surface, disengaging surface, actuating surface and releasing surface, movement of a corresponding actuating and releasing surface of a switching bar defining a switching path;

a plurality of catching members corresponding to said plurality of crosspoints, each catching member comprising a projection;

means for mounting respective ones of said catching members for movement along first and second directions, so disposed that each projection extends between a respective engaging and a respective disengaging surface of the selection bar defining the corresponding crosspoint for movement along said first direction in response to movement of said selection bar between the neutral and selection positions; said selection bar being in the selection position, each projection associated therewith being disposed to extend across the corresponding switching path of said switching bar surfaces, such that movement of the switching bar moves said projection along the second direction; said selection bar being in the neutral position, each projection associated therewith being disposed to one side of said path;



a plurality of coupling members corresponding to said projections;

means for mounting respective ones of said coupling members, and for coupling corresponding coupling members to corresponding projections for movement between a neutral and a switched position in response to movement of said projection in said second direction only;

a plurality of switches associated with respective crosspoints; and

means for actuating a respective switch in response to the position of the respective coupling member, said surfaces, projections, and coupling members being so arranged that:

1. a coupling member and a corresponding switching bar being in the neutral position and the corresponding selection bar being in the selection position, the corresponding projection is adjacent an actuating surface such that movement of the switching bar to the switching position will move the projection along the second coordinate direction thereby moving the coupling member to the switched position, thus actuating the corresponding switch;
2. a coupling member and a corresponding switching bar being in the switched and switching position respectively, the corresponding selection bar being in the selection position, the corresponding projection is adjacent a releasing surface such that movement of the switching bar to the neutral position will move the projection thereby moving the coupling member to the neutral position; and
3. upon movement of a selection bar to the neutral position, each projection associated with that bar is moved out of the path of the surfaces of the respective switching bar so that the corresponding coupling members remain in their previous positions independent of movement of the switching bars.

11. In a crosspoint switch including a base having thereon fixed contacts and movable contacts extending from said base in engageable relationship with said fixed contacts; and a coupling member slidably supported by said base above said movable contacts, said coupling member including a surface for pressing said movable contacts into engagement with said fixed contacts upon movement of said coupling member from a first to a second position, an improved coupling member translating arrangement comprising:

a catching member movably connected to said coupling member, said catching member including a projection, said catching member being so arranged that said projection is movable with respect to said coupling member along a coordinate direction orthogonal to a direction of movement of said coupling member between said first and second positions;

a switching bar having a recess therein for selectively engaging said projection and moving said coupling member; and

a selection bar having engaging and disengaging surfaces, one of said engaging surfaces being selectively engageable with said projection for moving said projection into said recess of the associated switching bar, and one of said disengaging surfaces serving to move said projection out of engagement with said recess, said selection and switching bars cooperating with said projection on said catching member to selectively move said coupling member from said first to said second position and from said second to said first position.

4,071,729

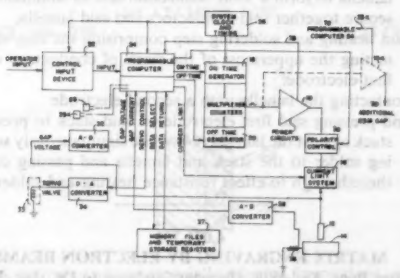
ADAPTIVE CONTROL SYSTEM AND METHOD FOR ELECTRICAL DISCHARGE MACHINING

Oliver A. Bell, Jr., Mooresville, N.C., assignor to Colt Industries Operating Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 475,573, June 3, 1974, abandoned. This application Jan. 19, 1976, Ser. No. 650,178

Int. Cl.[2] B23P *1/08*

U.S. Cl. 219—69 C **11 Claims**



1. In an electrical discharge machining apparatus including an electronic output switch operably connected between a power source and an EDM gap including an electrode and a workpiece for providing machining power pulses thereto, a current limiting system operably connected to the output switch for limiting the peak current of the machining power pulses being furnished to the gap, a digital pulse generator having controllable on and off times and a servo-feed system, wherein the improvement comprises:

a data input stage operably connected to the gap;

a memory file unit for storing previously accumulated control input data for like EDM operations; and

a programmable computer operably connected to and controlling said pulse generator, said programmable computer including a read-only memory unit, said programmable computer operable to determine maximum frequency of operation of the pulse generator responsive to difference between data transferred from said memory unit to said read-only memory unit and data entered into said memory unit from said gap data input stage, whereby maximum frequency is controlled with respect to current limit setting.

4,071,730

METHOD TO SECURE ARMATURE CONDUCTORS TO THE COMMUTATOR STRIPS IN DYNAMO ELECTRIC MACHINES

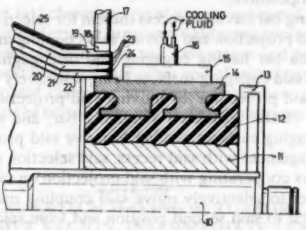
Gerd Bassler, Kornwestheim, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Mar. 24, 1976, Ser. No. 669,837

Claims priority, application Germany, Apr. 29, 1975, 2518973

Int. Cl.[2] B23K *1/12*

U.S. Cl. 219—85 CM **10 Claims**



1. In the manufacture of dynamo electric machines, a method to secure a plurality of superimposed armature winding conductors (19-22) to a commutator lamella (14) of the commutator of the machine comprising the steps of

superimposing the end portions of the conductors to form a stack of conductors;

locating the superimposed stack of conductors over a portion of the respective commutator lamella (14);

and, in a single operation, resistance-heating and soldering said superimposed conductors and said portion of the lamella to form a solid connection and to simultaneously secure together said conductors and said lamella,

said heating and soldering step comprising the step of contacting the uppermost of the stack of conductors with a first electrode;

contacting the lamella with a second electrode

and pressing said first electrode on said stack to press said stack against the lamella (14) while simultaneously supplying solder to the stack and lamella and passing current therethrough to effect resistance heating and soldering.

4,071,731

MATRIX ENGRAVING BY ELECTRON BEAMS

Walter Baar, Kiel-Wik, Germany, assignor to Dr. -Ing. Rudolf Hell GmbH, Kiel, Germany

Filed Feb. 18, 1975, Ser. No. 550,576

Claims priority, application Germany, Mar. 16, 1974, 2412685

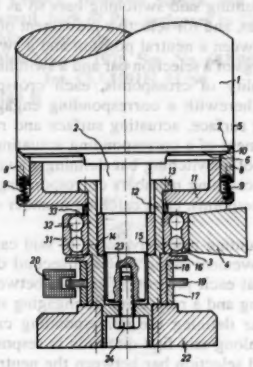
Int. Cl.[2] B23K *15/00*

U.S. Cl. 219—121 EB **7 Claims**

1. In an apparatus for producing engraved printing forms via an electron beam device which is located in a vacuum chamber having an open side facing a peripheral surface of a printing form cylinder and defining therewith an air gap, and an arrangement for effecting relative movement of said vacuum chamber and printing form cylinder while maintaining said air gap, the improvment comprising:

an annular member having an outer circumferential surface of a diameter corresponding to the outer diameter of said printing form cylinder, said printing form cylinder having a trunnion;

cooperating annular bevelled contact faces provided on



respective axial ends of said annular member and printing form cylinder, and

a mounting device for said annular member secured on said trunnion and mounting said annular member for displacement axially of said printing form cylinder,

so that, when said contact faces are coaxial and urged into abutment with one another, said outer circumferential surface constitutes an extension of said peripheral surface.

4,071,732

METHOD OF LARGE CURRENT GAS SHIELDED ARC WELDING

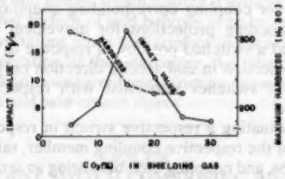
Jinkichi Tanaka, and Itaru Watanabe, both of Yokohama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Toyko, Japan

Filed Nov. 21, 1975, Ser. No. 634,322

Claims priority, application Japan, Nov. 27, 1974, 49-135559

Int. Cl.[2] B23K *9/16*

U.S. Cl. 219—137 R **4 Claims**

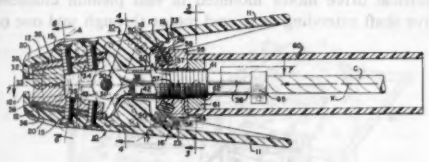


1. A method of high speed and large current gas shielded electric arc welding of steel using a mixture of inert gas and active gas as shielding gas, comprising the steps of: using at least one solid wire consumable electrode of low alloy steel material with a diameter substantially between 3.0 mm and 6.4 mm; feeding said electrode with a welding current of from 600 to 1500 amperes; supplying a shielding gas of from 50 to 200 l/min per electrode so as to shield an arc generated; and adjusting an arc voltage within a range of substantially from 23 to 36 volt.

4,071,733
HOLDER FOR WELDING ELECTRODE

Philip J. Pishioneri, 309 Joffre St., Ellwood City, Pa. 16117

Filed Jan. 6, 1977, Ser. No. 757,163
Int. Cl.[2] B23K *9/28*
U.S. Cl. 219—141 9 Claims



1. A holder for supporting a welding electrode and connecting it to a current carrying cable entering the holder, comprising:

a. an externally threaded tubular member having an axial bore therethrough receiving said cable at one end and having a transversely disposed pivot at the other end;

b. a pair of jaw support members disposed on opposite sides of said tubular member and each connected intermediate its ends with said pivot, each of the support members having a handle portion at one end overlying the tubular member and having at its other end a jaw portion extending beyond the pivot and having electrode gripping means, the electrode gripping means on the jaw support portions of the paired support members being mutually opposed;

c. a spring holding collar surrounding the tubular member and axially positionable thereon beneath said handle portions, the collar having spring locating means facing outwardly toward each handle portion, and the handle portions of the jaw support members each having a spring locating means facing toward said collar;

d. a pair of springs mounted in said spring locating means and each extending between the collar and a different one of said handle portions, thereby urging the handle portions apart and the jaw portions together, the springs and locating means being located at about the same distance from the pivot as the electrode gripping means of the jaw portions and on the other side of the pivot therefrom;

e. conductor means joining said electrode gripping means to said cable; and

f. sleeve means threadedly engaging said tubular member and abutting said collar, and operative to adjust the compression of said springs when the sleeve means is screwed axially back and forth on the tubular member.

4,071,734
POWDER ELECTRODE STRIP FOR SURFACING WITH WEAR-RESISTANT ALLOY

Anatoly Vasilievich Zarechensky, ulitsa Ilicha, 139, kv. 23; Alexei Afanasievich Kolechko, ulitsa Krasina, 19; Vladimir Mikhailovich Manov, prospekt Metallurgov, 35, kv. 89; Alla Grigorievna Korjukova, prospekt Stroitelei 70, kv. 118; Vasily Grigorievich Savran, ulitsa Volochaevskaya, 43a, and Alexandr Nikitich Serenko, prospekt Metallurgov, 25/27, all of Zhdanov, U.S.S.R.

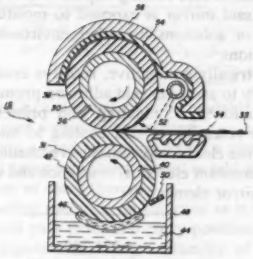
Filed Dec. 8, 1975, Ser. No. 638,859
Int. Cl.[2] B23K *35/368*
U.S. Cl. 219—146.31 2 Claims

1. A powder electrode strip for surfacing with a wear-resistant alloy comprising a steel shell filled with a powdered mixture consisting essentially of, by weight of the powder electrode strip, from 12 to 13% chromium, from 20 to 22% iron, from 0.2 to 0.3% graphite, from 1 to 1.2% ferrochromium having 0.6 to 0.8% carbon, 0.6 to 0.8% of crystalline silicon or silicocalcium with the silicon content being not less than 60& of the silicocalcium, from 14 to 16% manganese, from 0.6 to 1% titanium, from 2 to 3% titanium dioxide and the balance is the iron represented by the steel shell.

4,071,735
EXTERNALLY HEATED LOW-POWER ROLL FUSER

Rabin Moser, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 1, 1976, Ser. No. 737,300
Int. Cl.[2] H05B *1/00*; G03G *15/00*
U.S. Cl. 219—216 6 Claims



1. Contact fuser apparatus for fusing toner images to copy substrates by passing the copy substrates through a nip formed between a pair of fuser members, said apparatus comprising:

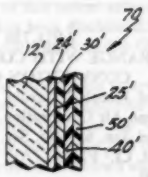
a single source of radiant thermal energy, said radiant source of thermal energy being positioned adjacent the inlet of the nip of said fuser apparatus and externally of the fuser members so that a portion of said energy is directed toward one of said fuser members, said portion of said energy being sufficient to elevate the surface of said one of said fuser members to a level capable of fusing at least low density images; and

said position of said radiant thermal energy being such that another portion of this energy is directed toward toner images carried by said copy substrates whereby said another portion impinges upon said toner images prior to said copy substrate entering said nip, said another portion serving to pre-heat high density toner images.

4,071,736
DEFROSTING MIRROR

Marc A. Kamerling, Holland, Mich., assignor to Donnelly Mirrors, Inc., Holland, Mich.

Filed Feb. 12, 1976, Ser. No. 657,610
Int. Cl.[2] H05B *1/00*
U.S. Cl. 219—219 23 Claims



1. A defrosing mirror especially adapted for outdoor use on the exterior of vehicles or the like comprising:

a mirror element having a light-reflective coating on one surface thereof;

an electrically conductive, resistive, coating applied over at least one surface of said mirror element to generate heat when electricity is conducted therethrough, said coating including a layer of binder material adhering to said mirror surface and a plurality of graphite particles dispersed in contact with one another throughout said binder material;

conducting means for conducting electricity to and from respectively opposing portions of said electrically conductive coating to form an electrical circuit through said coating, said opposing portions being spaced apart across said one surface of said mirror element over which said electrically conductive coating is applied; and

an adhesion promoting, primer layer intermediate said one surface of said mirror element and said electrically conductive, resistive coating and uniformly contacting said mirror element surface and electrically conductive coating and bonded to said surface and coating to facilitate retention of said coating on said mirror element especially when said mirror is exposed to moisture, humidity, salt spray or solutions, or other environmental or weather conditions;

said electrically conductive, resistive coating being applied directly to and over said adhesion promoting primer layer and uniformly contacting said primer layer to ensure proper retention of said coating to said mirror element, while the electrically conductive coating ensures substantially constant electrical resistance and uniform heating of said mirror element.

4,071,737

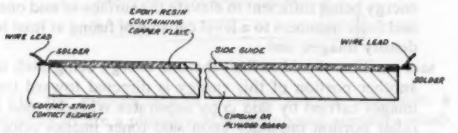
HEATING PANEL

David W. Marshall, North Reading, and Jagdish Chandra Agarwal, Concord, both of Mass., assignors to Kennecott Copper Corporation, New York, N.Y.

Division of Ser. No. 481,527, June 21, 1974, Pat. No. 3,983,075. This application Sept. 23, 1976, Ser. No. 725,737

Int. Cl.[2] H05B *3/14*

U.S. Cl. 219—345 **2 Claims**



1. A heating panel comprising a pair of electrical leads, one on one end and the other on the other end thereof, a contact for said electrical lead with said panel and as heating medium of said panel, an epoxy resin cured with a polyamide curative, admixed to said resin from 60 percent to 25 percent of copper, in flake form, said copper flake having been cleaned to remove impurities and/or oxides until the total amount of impurities in the flake is less than 7000 ppm, said heating panel having, under a heating load, substantially invarient resistivity for a period of at least 120 days.

4,071,738

VENTILATED RANGE WITH CONVERTIBLE RADIANT CONVECTION OVEN

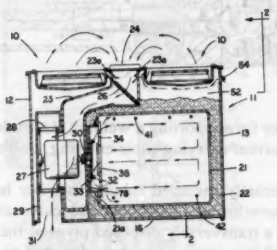
Louis J. Jenn, and Joseph J. Cerola, both of Indianapolis, Ind., assignors to Jenn Air Corporation, Indianapolis, Ind.

Filed Jan. 6, 1976, Ser. No. 646,906

Int. Cl.[2] F27D *11/02*; A21B *1/00*

U.S. Cl. 219—400 **5 Claims**

1. A range having ventilated surface cooking units and an oven operable in either a radiant mode or a convected mode and utilizing a first air moving means for providing ventilation of the surface units and a second air moving means for providing the convection air circulation in the oven, said range including a range housing supporting electrical surface cooking units and an oven enclosure having thermally insulated walls and having conventional upper and lower electrical heating elements therein, said oven enclosure being disposed below said surface units and having a frontal opening and an oven door for closing said opening, means forming an air plenum chamber along one sidewall of said oven enclosure and extending between an intake aperture adjacent the surface units and a discharge aperture adjacent the range housing base, said first air moving means being disposed in said plenum chamber, a housing inset in said one oven enclosure sidewall for accommodating said second air moving means, means for mounting said second air moving means including a switch-controlled electrical drive motor mounted in said plenum chamber, a drive shaft extending from said motor through said one oven



sidewall into said inset housing and supporting said second air moving means therein, said inset housing having an intake aperture communicating with the oven interior and an exhaust aperture adjacent each of said conventional upper and lower oven heating elements, whereby operation of said second air moving means provides forced circulation of air within said oven, the circulating air being heated by said conventional oven heating elements.

4,071,739

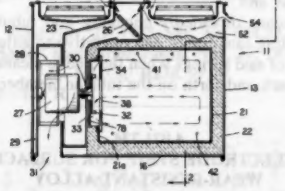
CONVERTIBLE RADIANT CONVECTION OVEN

Louis J. Jenn, and Joseph J. Cerola, both of Indianapolis, Ind., assignors to Jenn Air Corporation, Indianapolis, Ind.

Continuation of Ser. No. 646,906, Jan. 6, 1976. This application Mar. 10, 1977, Ser. No. 776,118

Int. Cl.[2] F27D *11/02*

U.S. Cl. 219—400 **4 Claims**

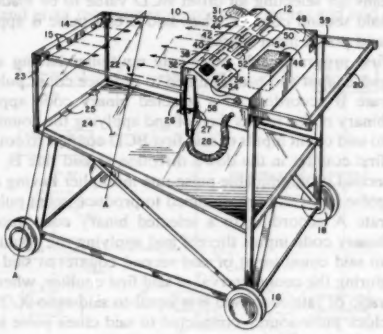


1. An oven operable in either a radiant mode or a convected mode and including an oven enclosure with conventional upper and lower heating elements therein, air moving means, a housing for said air moving means outside of said oven enclosure but disposed adjacent one wall thereof, said housing having an intake aperture and two discharge apertures communicating with the interior of the oven enclosure, one of said discharge apertures being located adjacent said upper oven heating element and the other adjacent said lower oven heating element, the location of said air moving means exteriorly of said oven enclosure and the placement of said discharge apertures adjacent said upper and lower heating elements permitting said oven to be selectively operated, when said heating elements are energized, in either the radiant mode when said air moving means is not in operation or in the convected mode when said air moving means is in operation.

4,071,740
MOBILE AUTOMATED SHOPPING SYSTEM

Paul Gogulski, 7 Maple Circle, Scarborough, Maine 04074

Filed May 26, 1976, Ser. No. 689,968
Int. Cl.[2] G06K *15/18, 15/02;* E04H *3/04*
U.S. Cl. 235—431 4 Claims



1. An improved automated shopping system means for the purchasing of line-encoded identified products and articles utilized in stores of the type having shopping carts having associated therewith apparatuses providing product code indicia scanning means and weight sensing means utilized in conjunction and communication with a governing central computer, having stored product information related to said line-encoded indicia, by means of radio transmitting and receiving units wherein the improvement comprises:

a control panel and associated visual display unit affixed to said shopping cart for operation of a cart of said shopping system and for indication by display of said line-encoded product representative indicia;

a first line-encoded indicia scanner releasably mounted upon and connected with said control panel to read said line-encoded indicia upon said products having means responsive to said first scanner to decode and to display upon said visual display said product information derived by said first scanner from said products by means of transmission and reception of said product information with said central computer;

a second line-encoded scanner mounted within said control panel having means to decode and to cause display upon said visual display of said product line-encoded information derived from said products by means of transmission and reception of said information with said central computer;

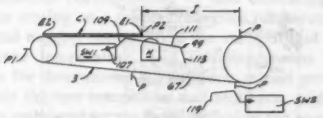
a plurality of photocell sensing units positioned about the perimeter of the opening of said shopping cart to direct a plane of light across said cart opening to sense certain entries into said cart, said sensing units being responsive to said second scanner and decoding means such that said photocell sensing units deactivate for a predetermined period of time after said second scanner reads and decodes said line-encoded information to allow the insertion of a product or article in said cart and after said time period reactivates to provide a warning if an article is attempted to be inserted within said cart without first being scanned by said second scanner; and

said weight-sensing means being within the bottom of said cart and having an associated comparator circuit in said control panel in communication with said central computer to provide a means of comparison of actual and computer stored product weights and to provide a warning if said weights do not correspond.

4,071,741
CARD VALIDATOR

Joseph R. Frattarola, Westford, and Peter W. Ford, Winchester, both of Mass., assignors to UMC Industries, Inc., Stamford, Conn.

Filed Mar. 26, 1976, Ser. No. 670,698
Int. Cl.[2] G06K *13/07, 7/08;* G07F *1/06;* B65H *9/04*
U.S. Cl. 235—436 15 Claims



1. A validator for a card bearing a code readable by moving the card forward past a reader, comprising:

means for guiding a card for travel along a predetermined path, the card being movable forward in said guide means from a position of entry therein;

a reader for reading the code on the card as it travels forward along said path from said entry position;

card transport means comprising a plurality of pushers of which a first is movable forward from a starting position trailing the card in entry position to a second position to engage the trailing end of the card and push it forward from the entry position to a second position, and a second is movable forward with the first from a starting position leading the card in entry position to a second position and is movable in the reverse direction to push the card back in the guide means for return of the card; and

means for driving the card transport means in forward direction for the first pusher to push a card forward in the guide means from its entry position past the reader to read the code on the card and deliver the card to the second position, and for driving the card transport means in the reverse direction for the second pusher to push a card back in the guide means for return of the card, said driving means including means for maintaining the position of the pusher at the trailing end of a card in the second position for preventing the card from being pulled back out of the guide means while allowing the card transport means to be driven in the reverse direction.

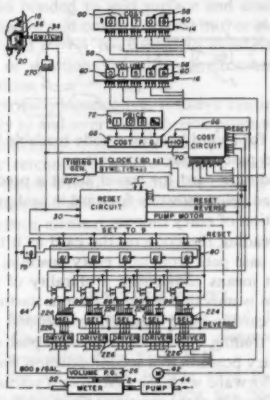
4,071,742
ROTARY ELECTROMAGNETIC INDICATOR SYSTEM

Donald Whiting Fleischer, Wethersfield, Conn., assignor to Veeder Industries, Inc., Hartford, Conn.

Continuation-in-part of Ser. No. 584,216, June 5, 1975, Pat. No. 4,012,623. This application July 16, 1976, Ser. No. 706,129
The portion of the term of this patent subsequent to Mar. 15, 1994, has been disclaimed.
Int. Cl.[2] B67D *5/06;* G08B *28/00;* G06M *1/10*
U.S. Cl. 235—92 FL 29 Claims

1. In a volume and cost registration system for a fuel pump computer having resettable volume and cost registers for registering decimal counts respectively of the volume amount of fuel delivered and the cost amount of fuel delivered in accordance with the volume amount delivered and a pre-established unit volume price, each register comprising a bank of decimal counter wheels of increasing order and electromagnetic wheel indexing means operable for angularly indexing the bank of decimal counter wheels for registering the decimal count of the respective amount of fuel delivered, and cost and volume register drive means for operating the electromagnetic wheel indexing means of the volume and cost registers for indexing the banks of volume and cost counter wheels for registering decimal counts of the volume and cost amounts respectively of fuel delivered as the fuel is delivered, the improvement wherein the electromagnetic wheel indexing means of the cost register is operable for indexing each cost counter wheel digi-

tally for registering the decimal cost count in digital form, wherein the electromagnetic wheel indexing means of the volume register is operable for stepping the lowest order volume counter wheel a plurality of individual steps for each decimal count thereof for registering the decimal volume count in analogue form, and wherein the cost and volume register drive means operates the electromagnetic wheel indexing means of the cost register to register the decimal cost count of fluid delivered in said digital form and operates the electro-



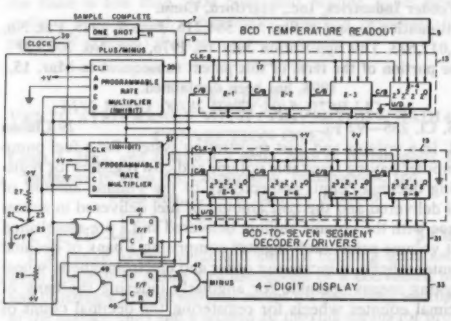
magnetic wheel indexing means of the volume register to register the decimal volume count of fluid delivered in analogue form with the lowest order volume counter wheel stepped said plurality of individual steps for each decimal count thereof as the fuel is delivered and so that the decimal volume count in said analogue form of the volume register continually substantially corresponds to said decimal cost count in said digital form of the cost register in accordance with said pre-established unit volume price.

4,071,743

DIGITAL SCALE CONVERTER

Richard G. Upton, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 7, 1977, Ser. No. 766,277
Int. Cl.[2] G06M *3/02*
U.S. Cl. 235—92 CV **3 Claims**



1. A digital scale converter for converting a binary coded decimal (BCD) value of a first scale to the equivalent value of a second scale according to a known ratio X/Y, comprising:

a readout means for registering the first scale value prior to conversion, said readout means having a plus/minus indicator output;

a first BCD counter having inputs for accepting said first scale value from said readout means in response to a reset pulse applied to a preset input thereof, said first counter having a count pulse input and a zero count output;

a second BCD counter having a count pulse input, a preset input and BCD count outputs;

means for generating and applying said reset pulse to said preset inputs of said first and second counters at the beginning of each conversion;

means for selecting an offset BCD value to be loaded into said second counter when said preset pulse is applied to said preset input thereof;

a first programmable pulse rate multiplier having a clock pulse input and programmed to produce count pulses at a rate B according to a selected binary code applied to binary coded inputs thereof and applying the count pulses to said count inputs of said first BCD counter to count said first counter in the down direction at said rate B;

a second programmable pulse rate multiplier having a clock pulse input and programmed to produce count pulses at a rate A according to a selected binary code applied to binary code inputs thereof and applying the count pulses to said count input of said second counter at said rate A during the count interval of said first counter, wherein the ratio of rate A to rate B is equal to said ratio X/Y;

a clock pulse source connected to said clock pulse input of said first and second rate multipliers;

switching means for selecting and applying said binary code to said binary coded inputs of said first and second rate multipliers according to the desired pulse rate ratio A/B;

a bistable switching means having a reset output connected to a count direction control input of said second counter;

gating means responsive to said plus/minus indicator output of said readout means for operating said bistable switching means in response to said reset pulse to switch said second counter to count in the up direction when said offset value is to be added to the converted value and to count in a downward direction when said offset value is to be subtracted from the converted value, said bistable switching means having a direct reset input connected to zero count output of said second counter so that said second counter is switched to count in the up direction when said offset value is counted down to zero during the conversion; and

means responsive to the zero count output of said first counter for reading the count pulses registered by said second counter and displaying said second counter registered value as said second scale value when said first counter is counted to zero.

4,071,744

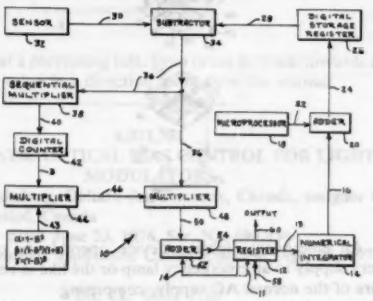
LOOP INTEGRATION CONTROL SYSTEM

Eugene J. Pollock, 3000 San Pasquale, Albuquerque, N. Mex. 87110

Filed May 13, 1976, Ser. No. 685,840
Int. Cl.[2] G05B *13/02*
U.S. Cl. 364—105 **14 Claims**

1. An In-Loop Integration Control System comprising means for receiving and storing a state vector measurement input, said state vector measurement being defined in terms of time, position, velocity and acceleration, means operatively connected to said receiving and storing means for receiving said acceleration term of said state vector measurement and for computing therefrom an estimate of a next actual measurement, means for providing systematic error terms for use within said system, means operatively connected between said systematic error term providing means and said computing means for combining the outputs therefrom thereby producing a corrected estimate of the next actual measurement, means operatively connected to said combining means for storing said corrected estimate of said next actual measurement, means for providing the next actual measurement, means operatively connected between said next actual measurement providing means and said storing means for comparing the outputs therefrom thereby producing sequential error measurements, means

operatively connected to said comparing and error measurement producing means for comparing two of said sequential error measurements and producing an output therefrom, means operatively connected to said comparing means for generating an adaptive gain signal from said output, means operatively connected to said adaptive gain signal generating means for combining said adaptive gain signal with a plurality of polynomial equations thereby producing a plurality of adaptive gain multipliers, means operatively connected between said comparing and error measurement producing means and said com-



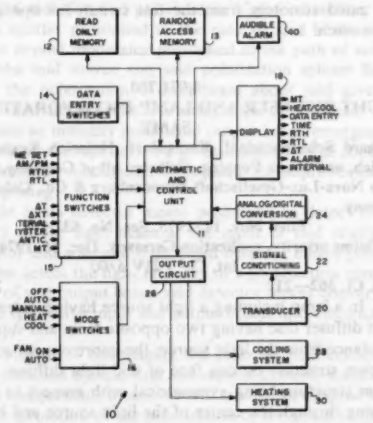
bining and multiplier producing means for computing correction terms therefrom, means operatively connected between said correction term computing means and said input storing and receiving means for combining said correction terms with said input state vector measurement to produce an updated state vector measurement which replaces said input state vector measurement in said system and said system continually comparing said corrected estimate of said next actual measurement with said next actual measurement maintaining the difference therebetween at zero.

4,071,745

PROGRAMMABLE TIME VARYING CONTROL SYSTEM AND METHOD

B. C. Hall, 5506 Commondore, Dickinson, Tex. 77539

Filed Mar. 4, 1977, Ser. No. 774,393
Int. Cl.[2] G05D *23/32*
U.S. Cl. 364—104 **19 Claims**



1. A system for controlling a measured temperature during a sequence of time intervals in accordance with a sequence of selected reference temperatures, each corresponding to one of the intervals, comprising:

means for storing a plurality of digital numbers, each representing a value of one of the reference temperatures;

means connectable to respond to a reference frequency source for repeatedly generating a digital number representative, at each generation, of the present time of day;

means for storing a digital number representative of a value of hysteresis;

updating means for repeatedly determining, from said time of day number, when one of said intervals embraces the present time and identifying the one of said reference temperatures corresponding to said embracing interval and for storing, as a current reference temperature value, a digital number representing the value of said identified reference temperature, said updating means including means for determining that as soon as said present time exceeds the last interval in said sequence, said time becomes embraced by the first interval in the sequence;

means connectable to be responsive to a sensor of said measured temperature for generating an electrical signal representation of said measured temperature;

comparison means responsive to said signal representation, to the current reference temperature number, and to the hysteresis number, for repeatedly generating control signals suitable for controlling thermal means affecting said measured temperature.

4,071,746

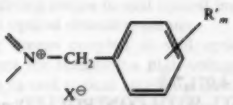
ALKYLBENZYL PYRIDINIUM COMPOUNDS AND USES

Patrick M. Quinlan, Webster Groves, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 232,208, March 6, 1972, abandoned. This application June 22, 1976, Ser. No. 698,586
Int. Cl.[2] C23F *11/14*
U.S. Cl. 252—392 **14 Claims**

1. An acid corrosion inhibiting composition comprising

1. substituted benzyl pyridinium compounds having the formula



where

is a pyridinium group, R′ is an alkyl group occurring as a substituent *m* times, and *m* is 1 to 2, X is an anion, said benzyl pyridinium compounds being formed by reacting a mixture of alkyl pyridines with the compound of the formula

and 2. an oxyalkylated surfactant or an alcohol.

4,071,747

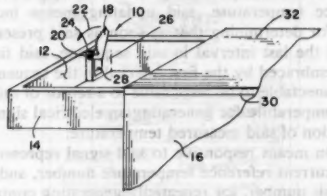
DRAWER ILLUMINATING DEVICE

Anthony C. Pantanella, 1215½ W. Ash St., Springfield, Ill. 62703

Filed Sept. 27, 1976, Ser. No. 726,674
Int. Cl.[2] A47B *97/00*
U.S. Cl. 362—127 **5 Claims**

1. A drawer illuminating device comprising a housing having a pair of compartments therein, a transparent lens remov-

ably secured to the housing covering an opening communicating to one of the compartments, a lamp having terminals, a socket, the lamp being removably secured within the socket, the lamp having a light emitting portion disposed in said one compartment, a battery having terminals, a switch having terminals, the terminals of the battery and the terminals of the switch and the terminals of the lamp being disposed in a series electrical circuit, the battery being removably secured within the other compartment, the switch being fixedly secured with the other compartment, the switch having an operating lever



extending outwardly from said other compartment, the switch having normally closed contacts connecting to the terminals thereof, a bar, a shaft, a portion of the shaft extending outwardly from the housing and journaled thereto, means to bias the shaft about the axis of rotation thereof, the bar having a hole, the extended portion of the shaft beinb disposed removably engaged within the hole, the bar extending radially outwardly from the shaft and rotatable therewith when the bar is carried by the extended portion of the shaft, means to secure the housing to an interior vertical surface of a drawer.

4,071,748

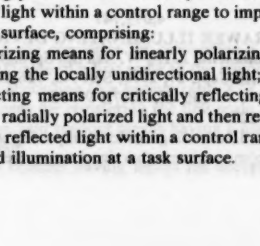
LIGHTING PANEL WITH CONTROLLED DISTRIBUTION OF POLARIZED LIGHT

Thomas W. Dey, Rochester, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Continuation-in-part of Ser. No. 542,526, Jan. 20, 1975. This application Mar. 29, 1976, Ser. No. 671,900

Int. Cl.[2] F21V *9/14, 5/00*

U.S. Cl. 362—19 **8 Claims**



1. A lighting panel for use in locally unidirectional light to distribute the light within a control range to improve illumination at a task surface, comprising:

radial polarizing means for linearly polarizing and radially distributing the locally unidirectional light; and

light refracting means for critically reflecting substantially all of the radially polarized light and then refracting all the critically reflected light within a control range to provide improved illumination at a task surface.

4,071,749

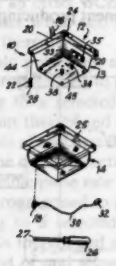
SELF-CONTAINED MAINTENANCE-FREE EMERGENCY LIGHTING

Andre Balogh, Tarrytown, N.Y., assignor to Tork, Inc., Mount Vernon, N.Y.

Filed July 22, 1976, Ser. No. 707,861

Int. Cl.[2] F21V *19/04;* **H05B** *37/00*

U.S. Cl. 362—20 **7 Claims**



1. An emergency lighting device operable to connect a battery supply to an emergency lamp or the like in response to failure of the normal AC supply, comprising

a. a base plate for mounting said device to a suitable surface;

b. means in the form of a dome-like, tough plastic, cover defining a housing for said device, said cover completely surrounding all components including said base plate, and said cover being free of any magnetic material adjacent the magnetically operated test switch recited hereinafter;

c. means for holding said cover in engagement with said base plate so as to secure said cover against tampering;

d. means within said housing for responding to a failure of AC power and for connecting the battery supply to the emergency lamp;

e. a reflector mounted to said base plate for reflecting light from said emergency lamp;

f. a magnetically operated test switch disposed immediately adjacent and inside said cover, said test switch being operable for simulating failure of AC power by disconnecting said power from the aforesaid means for responding, whereby the emergency lamp becomes illuminated in the event that said components are functioning properly;

g. means in the form of a removable magnet normally located remotely from the test switch for operating said switch.

4,071,750

LIGHT DIFFUSER AND LAMP INCORPORATING THE SAME

Richard Schneppendahl, Konigsdorf; Heinrich Kramer, Lovenich, and Franz Pepping, Pulheim, all of Germany, assignors to Nova-Lux-Gesellschaft Brandenburg & Co., Cologne, Germany

Filed Nov. 14, 1975, Ser. No. 632,171

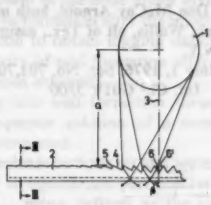
Claims priority, application Germany, Dec. 16, 1974, 2459327

Int. Cl.[2] F21V *5/00*

U.S. Cl. 362—217 **23 Claims**

1. In a lamp including a light source having a center and a light diffuser disc having two opposite faces and supported at a distance from the light source; the improvement comprising a prism structure on one face of said light diffuser disc, said prism structure being symmetrical with respect to a normal passing through the center of the light source and being perpendicular to the faces of said light diffuser disc, said prism structure being formed of a plurality of prisms extending parallel to one another, each prism having a frontal flank oriented towards the normal and a rear flank oriented away from the normal; the angle of inclination of the frontal flanks gradually

decreasing from prism to prism in a direction away from the normal and the angle of inclination of the rear flanks gradually



increasing, at a decreasing rate, from prism to prism towards an upper limit value in a direction away from the normal.

4,071,751
AUTOMATIC OPTICAL BIAS CONTROL FOR LIGHT MODULATORS

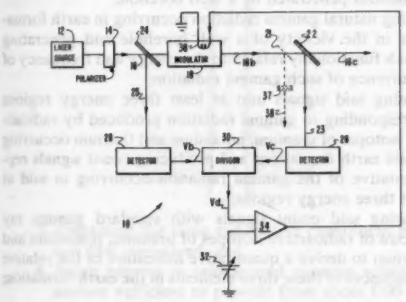
Armand Waksberg, Dollard-des-Ormeaux, Canada, assignor to RCA Limited, Canada

Filed June 23, 1976, Ser. No. 698,836

Claims priority, application United Kingdom, Apr. 26, 1976, 250978/76

Int. Cl.² G01J *1/20*

U.S. Cl. 250—201 **6 Claims**



1. An apparatus for providing modulation of light, of the type which comprises: a light source for providing a beam of coherent light radiation and polarized in a given direction; a polarization splitter positioned in the path of said beam; an electro-optic crystal modulator positioned in the path of said beam between said source and said polarization splitter for modulating the polarization of said beam about said given direction so that the polarization modulation of the beam is converted into an intensity modulated output beam, emerging from said polarization splitter, of a given intensity value about which said intensity modulation takes place; the improvement therein comprising:

a first light beam detector means positioned to detect the intensity of the light beam at the input of said crystal modulator and a second light beam detector means positioned to detect the light intensity of a polarization component of said output beam, said detector means converting said respective input and output beams into electrical signals,

a divisor means for establishing the ratio of the electrical signals obtained by said first and second detector means,

a variable compensator means for said modulator adapted to produce a rotation of the polarization of the beam at the output of said modulator and consequently vary the intensity of the beam emerging from said splitter,

means connected between said divisor means and said compensator means for operating said compensator means to maintain a constant ratio between said electrical signals detected by said detector means and consequently between the intensities of said input and output beams.

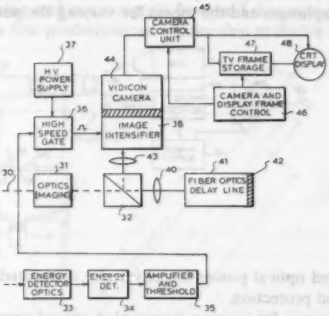
4,071,752
SELF-SYNCHRONIZING OPTICAL IMAGING SYSTEM

Richard J. Manning, Altamonte Springs, Fla., assignor to International Laser Systems, Inc., Orlando, Fla.

Filed May 7, 1976, Ser. No. 684,249

Int. Cl.² H01J *31/50*

U.S. Cl. 250—213 VT **15 Claims**



1. A self-synchronizing optical radiation imaging device comprising in combination:

optical receiving means for receiving optical radiation;

optical image delay means for delaying at least a portion of the optical radiation received by the optical receiving means;

optical radiation detection means for detecting optical radiation received by said receiving means;

means to direct the optical radiation received by said optical receiving means to said optical image delay means and to said optical detection means;

gating means coupled to said optical radiation detecting means for actuating a high voltage gating signal responsive to said optical receiving means receiving a predetermined level of optical radiation;

image intensifier means for intensifying optical radiation received by said optical receiving means; and

means to direct the delayed optical radiation from said optical delay means to said image intensifier means after a predetermined delay whereby said gating means activites said image intensifier means upon receiving optical radiation of a predetermined level in time to receive delayed optical radiation of a predetermined level for the duration of the predetermined level of said optical radiation.

4,071,753
TRANSDUCER FOR CONVERTING ACOUSTIC ENERGY DIRECTLY INTO OPTICAL ENERGY

John E. Fulenwider, Concord, and John Gonsalves, Woburn, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Mar. 31, 1975, Ser. No. 563,869

Int. Cl.² G02B *5/14*

U.S. Cl. 250—227 **5 Claims**

1. A transducer for converting acoustic energy directly into optical energy without first converting the energy into electrical form comprising:

an input optical fiber for carrying steady state optical power and having an output end;

a source of steady state optical power connected to the input optical fiber;

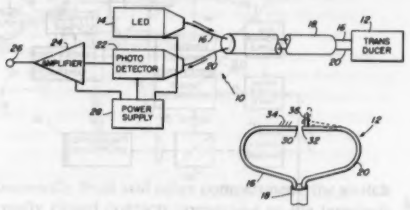
an output optical fiber for carrying modulated optical power and having an input end, the input end being normally optically positioned relative to the output end of the input

fiber so that a predetermined portion of the optical power carried by the input optical fiber is coupled into the output optical fiber;

a diaphragm for receiving acoustic information containing energy from a source and for producing at an output an oscillatory mechanical motion indicative of the acoustic information;

means responsive to the mechanical output of the diaphragm for varying the portion of optical power coupled between the input optical fiber and the output optical fiber; and

a transducer housing to which the output end of the input optical fiber, the input end of the output optical fiber, the diaphragm and the means for varying the portion of coupled optical power are physically connected for support and protection,



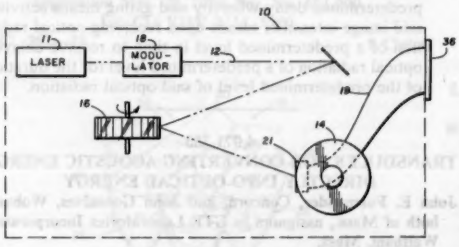
the means for varying the coupled optical power including the respective end of one of the optical fibers being fixedly positioned within the transducer housing and the respective end of the other of the optical fibers being connected to the diaphragm so that upon impingement of information containing acoustic energy against the diaphragm relative oscillatory lateral movement is established between the respective ends of the optical fibers to cause a variance in the optical power coupled into the output optical fiber thereby providing amplitude modulation of the optical power carried by the output optical fiber.

4,071,754

BEAM ALIGNMENT DETECTOR

Poul B. Roulund, Irving, Tex., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 22, 1976, Ser. No. 679,640
Int. Cl.² G02B *5/14*; H01J *5/16, 39/12*
U.S. Cl. 250—227 **9 Claims**



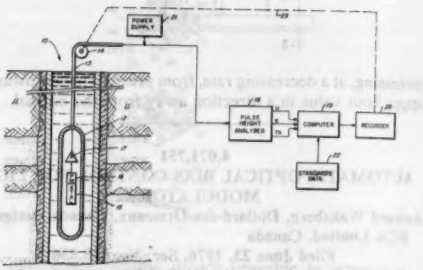
1. In a scanning system: an illumination source generating a beam; means for scanning said beam as a spot across a target area; a detector located at said target area; an indicator for indicating alignment and misalignment of said beam with said detector; said indicator comprising at least three fiber-optic bundles, each of said bundles having an input end and an output end; said detector being aligned with one of said bundle input ends in the direction of scan; the remaining bundle input ends being located one on each side of said one bundle input end in a direction transverse to said direction of scan; the output ends of said bundles being located at an observation area remote from said target area.

4,071,755

METHOD FOR IN SITU EVALUATION OF THE SOURCE ROCK POTENTIAL OF EARTH FORMATIONS

Irwin R. Supernaw; Dan McCay Arnold, both of Houston, and Arthur Jürgen Link, Wallis, all of Tex., assignors to Texaco Inc., New York, N.Y.

Filed July 1, 1976, Ser. No. 701,702
Int. Cl.² G01V *5/00*
U.S. Cl. 250—253 **5 Claims**



1. A method for determining the source rock potential of shale formations penetrated by a well borehole, comprising the steps of:

moving a well tool having a gamma ray detector past earth formations penetrated by a well borehole;

detecting natural gamma radiation occurring in earth formations in the vicinity of a well borehole and generating signals functionally related to the energy and frequency of occurrence of such gamma radiation;

separating said signals into at least three energy regions corresponding to gamma radiation produced by radioactive isotopes of uranium, potassium and thorium occurring in said earth formations and producing count signals representative of the gamma radiation occurring in said at least three energy regions;

comparing said count signals with standard gamma ray spectra of radioactive isotopes of uranium, potassium and thorium to derive a quantitative indication of the relative abundances of these three elements in the earth formation; and

deriving by comparing said relative abundances according to a predetermined relationship an indication of the organic carbon content of the earth formations, thereby obtaining an indication of the source rock potential of the earth formation.

4,071,756

DETERMINATION OF RESIDUAL OIL IN A SUBTERRANEAN FORMATION

Burton M. Casad, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed May 10, 1976, Ser. No. 684,989
Int. Cl.² G01V *5/00*
U.S. Cl. 250—260 **8 Claims**

1. A method for obtaining logging data, for use in determination of the amount of residual oil in a subterranean oil-bearing formation which has been penetrated by the wellbore of a well and which has been subjected to waterflooding for the secondary recovery of oil therefrom, said method comprising;

a. logging the formation to obtain logging data measurements of the natural radioactivity of the formation;

b. injecting into the formation through said wellbore a first aqueous solution of a first compound, said first compound

1. being water-soluble and substantially insoluble in said residual oil;

2. containing at least one radioactive constituent; and,

3. being present in said first aqueous solution in an amount sufficient to provide from about 0.05 to about 5.0 microcuries of radioactivity per cc of injected fluid,

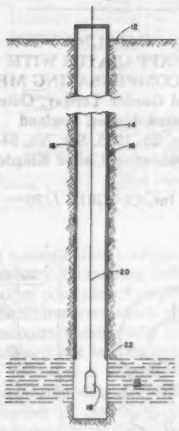
said first aqueous solution being injected in an amount sufficient to displace substantially all of the formation water present in the zone under investigation;

c. logging the formation after the injection of said first aqueous solution to obtain logging data measurements of the radioactivity of said formation after the injection of said first aqueous solution;

d. injecting into said formation through said wellbore a second aqueous solution of a second compound, said second compound

1. being soluble in both oil and water;

2. having an equilibrium partition ratio, $R_{o/w}$ greater than 1.0, $R_{o/w}$ being defined as the concentration of said second component in said residual oil divided by the concentration of said second component in water at equilibrium;



3. containing the same radioactive constituent present in said first compound; and,

4. being present in said second aqueous solution in an amount sufficient to provide from about 0.05 to about 5.0 microcuries of radioactivity per cc of injected fluid said second solution being injected in a sufficient volume to result in substantial equilibrium between the concentration of said second compound in said residual oil and said second aqueous solution in said zone under investigation; and,

e. logging the formation after the injection of said second aqueous solution to obtain logging data measurements of the radioactivity of said formation after the injection of said second aqueous solution.

4,071,757

DETECTION OF BEHIND CASING WATER FLOW AT AN ANGLE TO THE AXIS OF A WELL BOREHOLE

Dan M. Arnold, and Hans J. Paap, both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed June 21, 1976, Ser. No. 698,398

Int. Cl.[2] G01V *5/00*

U.S. Cl. 250—265 **12 Claims**

1. A method for measuring the location, linear flow rate, volume flow rate and angle of flow of undesired water flow at an angle θ to the borehole axis behind well casing in a producing well, comprising the steps of:

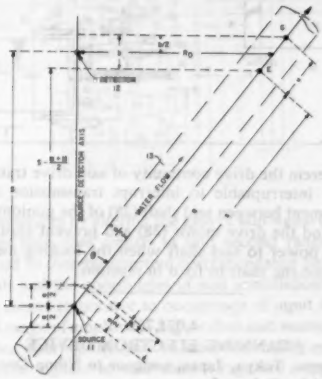
a. locating a well tool sized for passage through a well bore and having a source of high energy neutrons at least some of which have sufficient energy to cause the nuclear reaction $O^{16}(n,p)N^{16}$ and at least two gamma ray detectors longitudinally spaced from said source and each other in a well bore at a depth to be investigated;

b. irradiating the borehole environs with high energy neutrons from said source;

c. detecting at said detectors gamma rays resulting from the decay of the unstable isotope N^{16} comprising a portion of any undesired behind casing flow present and generating count signals representative thereof;

d. separating said count signals from each of said detectors into at least two separate energy dependent signals related to the energy of the gamma rays causing said signals and generating a ratio signal representative of the ratio of the at least two separate energy dependent signals at each of said detectors;

e. combining said count signals from said detectors according to a first predetermined relationship to derive an indication of the linear flow rate of undesired behind casing water flow in a preferred direction;



f. generating from said ratio signals according to a second predetermined relationship an indication of the radial distances R_1 and R_2 from said dual spaced detectors to the undesired behind casing water flow;

g. combining said indication of linear flow rate and at least one of said indications of radial distance according to a third predetermined relationship to derive an indication of the volume flow rate of the undesired behind casing flow; and

h. deriving from said indicatios of radial distances R_1 and R_2 at each of said detectors, an indication of θ, said angle of flow with respect to the borehole axis.

4,071,758

MULTIPLE TEST X-RAY GONIOMETER

Alfred Steinbichler, Munich, Germany, assignor to Max-Planck-Gesellschaft zur Förderung der Wissenschafter e.V., Gottingen, Germany

Filed July 30, 1976, Ser. No. 710,301

Claims priority, application Germany, Aug. 4, 1975, 2534790

Int. Cl.[2] G01M *23/20*

U.S. Cl. 250—277 CH **10 Claims**

1. Multiple test X-ray goniometer for X-ray analysis of crystals, selectively, with respect to precession and rotation, without disturbance of crystal position with respect to an X-ray beam, comprising

a precession camera unit (**14**)

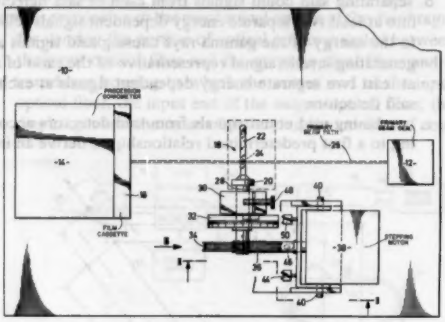
a goniometer head (**18**) located in the path (**26**) of a primary beam and having means (**22**) to hold a crystal test sample (**24**) in a predetermined position relative to said precession camera;

a shaft (**28**) rotatably supporting said goniometer head (**18**) and hence said crystal test sample (**24**);

a drive gearing (**34, 36**) coupled to the shaft (**28**) to rotate the shaft and hence the goniometer head (**18**), and with it the crystal test sample (**24**) in the holding means (**22**);

motor drive means (38) coupled to the drive gearing (34, 36), the drive gearing (34, 36) and the shaft forming a drive train for the goniometer head (18);

locking means (48) engageable with the shaft (28) of the goniometer head (20) to fix the goniometer head shaft (28) and hence the crystal test sample (24) in position;

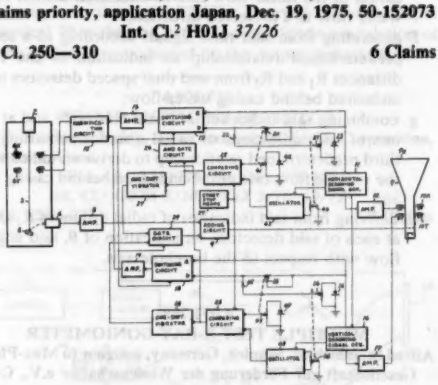


and wherein the drive continuity of said drive train is selectively interruptable to interrupt transmission of rotary movement between said shaft (28) of the goniometer head (20) and the drive motor (38) and prevent application of drive power to said shaft when the locking means have engaged the shaft to fix it in position.

4,071,759
SCANNING ELECTRON DEVICE

Takao Namae, Tokyo, Japan, assignor to Nihon Denshi Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 15, 1976, Ser. No. 750,643
Claims priority, application Japan, Dec. 19, 1975, 50-152073
Int. Cl.² H01J *37/26*
U.S. Cl. 250—310 **6 Claims**



1. In a scanning electron device comprising:

an electron gun for generating an electron beam;

deflecting means, which in response to X and Y deflecting signals, deflect said electon beam in a two-dimensional raster over a specimen;

a cathode ray tube having deflecting means which in response to X and Y deflecting signals scans an electron beam over the face of the cathode ray tube;

a scanning signal generator generating normal condition X and Y deflecting signals for the cathode ray tube and the deflecting means for the scanning electon beam such that they are scanned in synchronism;

a detector for detecting signals emanating from the specimen, the output of said detector being supplied to modulate the brightness of the beam scanning the cathode ray tube screen thus producing an image;

a magnification circuit arranged between the signal generator and the electron beam deflecting means for varying the amplitude of the electron beam X and Y deflecting signals and thus the magnification of the image produced on the cathode ray tube;

the improvement for enabling the simultaneous display of a low magnification image and a high magnification inset image simultaneously comprising

a modifying circuit for producing X and Y inset image scan deflecting signals having amplitudes and d.c. signal levels different from the output of the scanning signal generator output signals but of the same frequency;

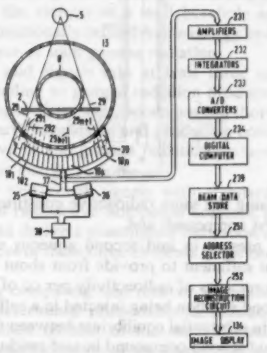
switching means arranged between the magnification circuit and the scanning signal generator and between the magnification circuit and the modifying means for switching between normal condition deflecting signals produced by the scanning signal generator and inset image deflecting signals produced by the modifying circuit;

and a switching signal generator for generating signals to control the switching means.

4,071,760
RADIOGRAPHY APPARATUS WITH PHOTOCELL DRIFT COMPENSATING MEANS

Christopher Archibald Gordon LeMay, Osterley, England, assignor to EMI Limited, Hayes, England

Filed Jan. 23, 1975, Ser. No. 543,338
Claims priority, application United Kingdom, Jan. 31, 1974, 4561/74
Int. Cl.² G01T *1/20*
U.S. Cl. 250—363 S **16 Claims**



10. Medical radiographic apparatus for examining a section of a patient's body by means of X-radiation, the apparatus comprising a source for projecting a substantially planar spread of said radiation through said section, a plurality of detectors for detecting the radiation projected through said section along respective beam paths irradiated by the spread, scanning means for orbiting the source and detectors around the body about an axis intersecting said spread and passing through said section, said detectors each producing successive output signals during an orbital movement through a substantial angle, each signal relating to a respective beam path through said section, means for effecting relative movement, at least between said detectors and said body, after said orbital movement has been effected so that each detector receives radiation projected through said section along a beam path which substantially overlies a beam path in respect of which another detector produced output signals during said orbital movement, means for comparing the output signals produced by different detectors and relating to radiation projected through the section along substantially the same beam path so as to generate comparison signals indicative of the relative sensitivities of said different detectors, and processing means for modifying the output signals produced by said detectors during said orbital movement, in dependance upon said com-

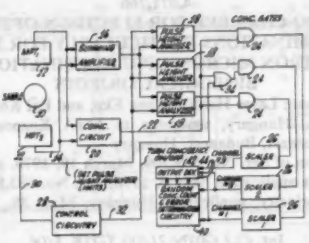
parison signals, to allow for said relative sensitivities, and for operating upon the modified output signals to evaluate the absorption or transmission coefficient, with respect to said radiation, at each of a plurality of locations in said section.

4,071,761

METHOD FOR DETERMINING RANDOM COINCIDENCE COUNT RATE IN A SCINTILLATION COUNTER UTILIZING THE COINCIDENCE TECHNIQUE

Donald L. Horrocks, Placentia, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed June 7, 1976, Ser. No. 693,652
Int. Cl.² G01T 1/20
U.S. Cl. 250—369 **11 Claims**



1. For use with a scintillation counter utilizing at least two detectors in a coincidence counting technique, a method for determining a random coincidence count due to events resulting in single-quantum emissions which may chance to occur in such a manner that pairs of essentially coincident single-quantum events are detected one in each detector and are erroneously counted as radioactive disintegrations occurring in a sample, said method comprising the steps of:

counting the number of essentially coincident events detected in both detectors of the counter;

counting the number events detected in both detectors, regardless of coincidence in time; and

determining from the results of said counting steps a random coincidence count rate attributable to chance coincidences of single-quantum events in accordance with the expression

$$S_c = (\tau c/2)\,(CPM_2 - CPM_1)^2,$$

where:

S_c = random coincidence count rate,

τ_c = coincidence resolving time, which is the longest time by which events can be separated and still considered coincident,

CPM_2 = counts per minute recorded in said second counting steps, and

CPM_1 = counts per minute recorded in said first counting step.

4,071,762

SCINTILLATION CAMERA WITH IMPROVED OUTPUT MEANS

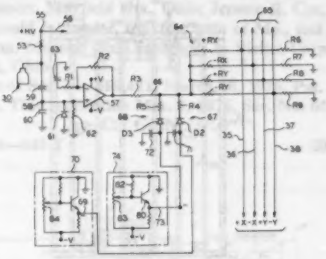
Kai Lange, Vedbaek, Denmark; Ernest J. Wiesen, Wauwatosa, and Eric M. Woronowicz, West Allis, both of Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 12, 1976, Ser. No. 731,150
Int. Cl.² G01T 1/20, 1/164
U.S. Cl. 250—369 **8 Claims**

1. Radiation imaging apparatus including means for producing scintillations in response to intercepted radiation, a plurality of photosensitive devices arranged adjacent each other on one side of said means for producing scintillations, said devices producing electric pulses, respectively, in response to occurrence of each scintillation, the positional relationship of said devices relative to said means for producing scintillations being such as to cause distortion in the relationship between the coordinates of the scintillations and the electric pulses,

signal converting means having input means for receiving said electric pulses as input signals and having output means, said signal converting means producing output signals which are generally representative of the coordinates of said scintillations,

first means responsive to occurrence of input signals above a first range of amplitudes and within a higher second range



of amplitudes by altering the gain of said signal converting means such that signals in said second range are suppressed to thereby improve correspondance between said signals and the coordinates of said scintillations, and

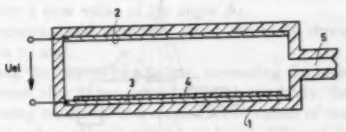
second means responsive to occurrence of input signals in a third range of amplitudes higher than said second range by further altering the gain of said converting means such that the signals in said third range are suppressed to thereby further improve correspondance between said signals and the coordinates of said scintillations.

4,071,763

ELECTRORADIOGRAPHIC DEVICE

Kristian Peschmann, Aachen, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed June 24, 1976, Ser. No. 699,343
Claims priority, application Germany, June 28, 1975, 2529037
Int. Cl.² G01T 1/18
U.S. Cl. 250—374 **6 Claims**



1. An electroradiographic device comprising:

two facing planar electrodes for connection to a voltage source;

a rare gas at superatmospheric pressure between said facing electrodes for absorbing x-radiation;

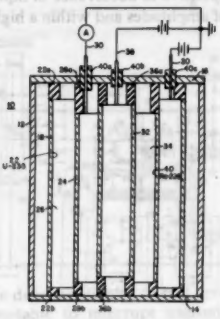
an insulating foil on one of said electrodes on the side facing the other of said electrodes for producing a charge image thereon; and

less than 2% by volume of a different gas mixed with said rare gas, said different gas having an ionization energy which does not exceed the ionization energy of the lowest metastable levels of the atoms of the rare gas.

4,071,764
GAMMA AND ALPHA COMPENSATED FISSION CHAMBER

Norman C. Thurlow, II, Horseheads, N.Y., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 31, 1976, Ser. No. 719,212
Int. Cl.[2] G01T *3/00*
U.S. Cl. 250—390 4 Claims

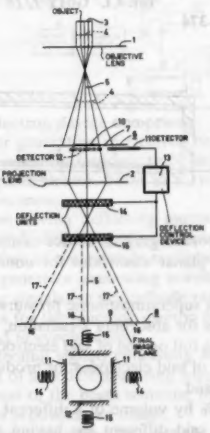


1. A fission chamber neutron detector comprising, a neutron sensitive volume which volume includes a high neutron cross section fissionable material and a predetermined gas fill with at least two electrical signal electrodes within the neutron sensitive volume, and a gamma and alpha signal compensation volume which volume includes a low neutron cross section alpha particle emissive isotope and a predetermined gas fill, with at least two compensation electrical signal electrodes within the compensation volume, whereby the respective volume output signals are combinable to give a resultant gamma and alpha compensated signal.

4,071,765
ELECTRON MICROSCOPE

Karel Jan van Oostrum, and Gerardus Gegorius Petrus van Gorkom, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 11, 1975, Ser. No. 639,863
Claims priority, application Netherlands, Dec. 17, 1974, 7416395
Int. Cl.[2] H01J *37/26*
U.S. Cl. 250—397 9 Claims



1. Electron beam apparatus, comprising:
an electron-optical lens system for forming a final image of an object with an electron beam, said system also forming with the electron beam at least one intermediate image of the object;
electron detection apparatus at the periphery of the intermediate image for detecting the difference between the actual position of the intermediate image and a reference position, said detection apparatus producing a signal indicative of the difference; and
beam deflection apparatus responsive to said signal for automatically deflecting the electron beam in a
direction which compensates for the difference, whereby the position of the final image of the object is thereby stabilized against movements of the object relative to the electron-optical lens system.

4,071,766
MICRO-CHAMBER FOR ELECTRON OPTICAL EXAMINATIONS PARTICULARLY FOR THE ELECTRON MICROSCOPIC EXAMINATION OF BIOLOGICAL OBJECTS

Erika Kalman; Lajos Haklik; Anna Eke, and Pál Kovács, all of Budapest, Hungary, assignors to MTA Kozponti Kemiai Kutato Intezet, Budapest, Hungary

Continuation of Ser. No. 559,709, March 19, 1975, abandoned. This application May 6, 1976, Ser. No. 683,832
Claims priority, application Hungary, Mar. 28, 1974, MA 2555
Int. Cl.[2] G01N *21/00;* G21K *5/06*
U.S. Cl. 250—443 4 Claims

1. A micro-chamber for the electron optical examination of liquids or wet specimens, comprising a casing having at least one small bore for the passage therethrough of an electron optical beam in alignment with said at least one small bore, a holder within the casing for a liquid or specimen wet with a liquid, a pressure-balancing buffer system to retard evaporation of the specimen by supplying vapor to the interior of the chamber, the chamber being closed to the escape of said vapor from the chamber other than through said at least one small bore, cooling means at least partially surrounding the casing for condensing vapors that escape from the chamber, there being two said bores, and a closing element arranged over at least one of said bores.

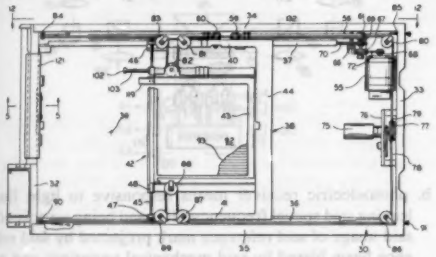
4,071,767
PALPATOR FOR X-RAY SPOT FILM DEVICE

Thomas Pury, Brookfield; Robert L. Konle, New Berlin, and Marvin L. Sivertsen, Milwaukee, all of Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 10, 1976, Ser. No. 740,571
Int. Cl.[2] G01N *21/34*
U.S. Cl. 250—444 2 Claims

1. Palpator means for a spot film device adapted to cooperate with an x-ray table having a patient supporting top, an x-ray source on one side of said top and a fluoroscopic device on said spot film device spaced from and on the opposite side of said top from said source, said spot film device having guide means on which said palpator means may be translated alternately between a rectracted inactive position and an active position in the path of the beam from said x-ray source, said palpator means comprising:
translatable means mounted for translation on said guide means,

reversible motor means mounted on said spot film device,
belt means extending along the path of travel of said translatable means,
means for coupling said motor means in driving relation with said belt means,
a latch member mounted on said translatable means for pivoting about an axis in opposite directions,
first spring means for urging said latch member to rotate in one direction,
second spring means coupled between said belt means and said latch member for urging it to rotate in a direction opposite of said one direction,
stationary means that are engageable and disengageable by said latch member, said latch member being actuated



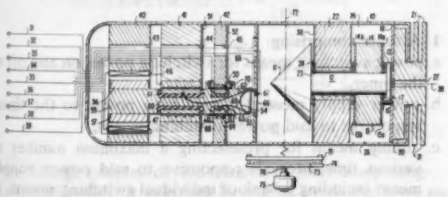
rotationally in opposition to said first spring means to engage with said stationary means when said translatable means is advanced to a predetermined position,
third spring means coupled between said belt means and said translatable means,
translation of said belt means by said motor means in one direction causing a force to be exerted through said third spring means for moving said translatable means to a position for said latch member to engage said stationary engageable means and operation of said motor means for translating said belt means in an opposite direction causing a force to be exerted through said second spring means to overcome the latching force of said first spring means to thereby release said translatable means for translating by said motor means.

4,071,768

X-RAY APPARATUS WITH ROTATIONALLY SYMMETRIC GAUSSIAN-LIKE FOCAL SPOT

David J. Goodenough, Buckeystown, Md., assignor to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Division of Ser. No. 703,378, July 8, 1976. This application June 23, 1977, Ser. No. 809,460
Int. Cl.² G01N *21/34, 23/04*
U.S. Cl. 250—444 **7 Claims**



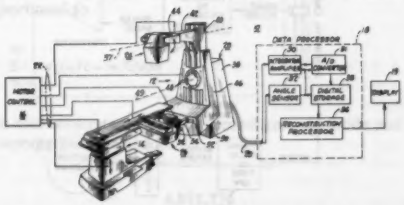
1. An X-ray apparatus comprising an envelope, an anode, a cathode and means for providing a rotationally symmetric, Gaussian-like focal spot distribution, including a support for an object to be subjected to X-ray radiation, and an image receptor holder positioned near said support, and wherein said apparatus includes an X-ray tube which produces an X-ray field having a central emergent beam which travels along a path, and said means for providing a rotationally symmetric, Gaussian-like focal spot distribution comprise means for effecting relative rotation between said X-ray tube and each of said support and said holder about an axis defined by said path of said central emergent beam.

4,071,769

TOMOGRAPHY SYSTEM HAVING NONCONCURRENT, COMPOUND AXIAL SCANNING

Carl J. Brunnett, Mayfield Hts., Ohio; Jerome R. Cox, Jr., St. Louis; Donald L. Snyder, Clayton, both of Mo., and Rodney A. Mattson, Mentor, Ohio, assignors to Picker Corporation, Cleveland, Ohio

Division of Ser. No. 559,411, March 18, 1975, Pat. No. 3,976,885. This application Mar. 1, 1976, Ser. No. 662,593
Int. Cl.² G01N *23/00*
U.S. Cl. 250—445 T **20 Claims**



1. A method of successively scanning the interior section of a body with an X-ray beam for determining the coefficients of absorption or transmission at spaced points in a plane through the body, the beam emanating from a source and detected by a detector in a source-detector assembly which maintains the detector in beam receptive alignment with the source, the assembly being rotatable through a set of angles γ_j about the body for orbiting the source and the detector through approximately 180° about the body and being rotatable about the source through a set of angles ϕ_i, where i and j are series of integers, comprising the steps of:

(a) rotating said assembly while maintaining the source and detector in alignment to orbit the source and detector about the body through the angles γ_j for a first preselected value of the angles ϕ_i;
(b) measuring the intensity of said beam after it has passed through the body, the intensity being measured at a first set of values of the angles γ_j;
(c) after completion of said step of successively rotating, incrementally moving the assembly about the source to provide a new value of the angle ϕ_i;
(d) re-rotating said assembly about the body through the angles γ_j and,
(e) during the step of re-rotating, measuring the intensity of the beam after it has passed through the body, the intensity being measured at a second set of values of the angles γ_j, the values of said second set being different from the values of said first set.

4,071,770

METHOD FOR EVALUATING PERINATAL LUNG MATURITY

Meir Shinitzky, Rehovot, and Abraham Bruck, Haifa, both of Israel, assignors to Elscint, Ltd., Haifa, Israel

Filed Apr. 14, 1976, Ser. No. 676,798
Claims priority, application Israel, Mar. 2, 1976, 49130
Int. Cl.² G01N *21/38*
U.S. Cl. 250—461 B **9 Claims**

2. A method for evaluating perinatal lung maturity comprising:

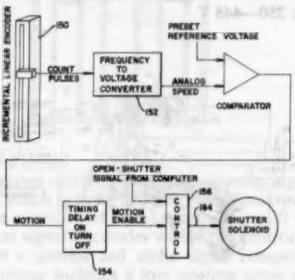
a. obtaining a sample of pulmonary effluent containing pulmonary surfactant;
b. labeling the surfactant with a fluorescent dye;
c. exciting the sample with polarized radiation for causing the sample to fluoresce; and
d. measuring the intensities of fluorescence polarized in directions parallel to, and perpendicular to, the direction of polarization of the excitation radiation.

4,071,771

SHUTTERS FOR X-RAY SCANNERS

John Covic, Wickliffe, and Thomas R. McBride, Chardon, both of Ohio, assignors to Ohio-Nuclear, Inc., Solon, Ohio

Filed June 28, 1976, Ser. No. 700,538
Int. Cl.[2] G21F 5/04
U.S. Cl. 250—505 **9 Claims**



1. A safety shutter mechanism for use in an X-ray scanner of the type wherein a source of radiation and a detector means are mounted for movement on opposite sides of a medium in order that the radiation passes through successive planar sections of medium and is attenuated and detected to give an output, comprising:

a housing adapted to be positioned adjacent the outlet aperture of the radiation source and having a passage through which can pass radiation leaving the outlet aperture and a generally cylindrical bore extending transversely to said passage;

a generally cylindrical shutter means rotatably mounted in said bore for selective arcuate movement between a first position which permits radiation to pass through said passage and a second position which blocks the flow of radiation through said passage;

biasing means engaging said shutter member and acting to continually bias said member toward the second position; and,

a rotary solenoid aligned with and drivingly connected with said shutter member for selectively moving said shutter member to said first position against said biasing means said rotary solenoid being operatively connected to the source of radiation so that it is actuated by a predetermined condition of movement of the source.

4,071,772

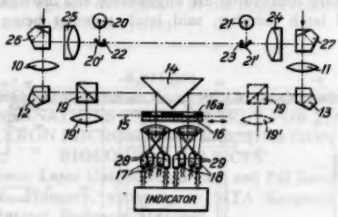
APPARATUS FOR MEASUREMENT OF MECHANICAL ABERRATIONS AFFECTING STEREOSCOPIC IMAGE ANALYSIS

Ludwig Leitz; Knut Heitmann, both of Wetzlar, and Horst Schmidt, Nauborn, all of Germany, assignors to Ernst Leitz GmbH, Wetzlar, Germany

Filed Oct. 23, 1975, Ser. No. 625,030
Claims priority, application Germany, Nov. 20, 1974, 2454883
Int. Cl.[2] G02B 27/38; G01C 11/12
U.S. Cl. 250—558 **17 Claims**

1. In an apparatus for analyzing stereoscopic images and determining the maximum correlation rate of two identical images of an object, having two objectives forming said images and including at least one spatial frequency filter superimposing said images, further containing a photoelectric receiver system coordinated to said spatial frequency filter and producing electrical output signals used in indicating and/or controlling means, the improvements comprising:

a. means generating at least one reference beam reacting on mechanical variations of said apparatus which influence the position of at least one image projected by said objective onto said spatial frequency filter, and projecting an image of a reference mark onto said spatial frequency filter;



b. photoelectric receiver means responsive to light fluxes leaving said spatial frequency filter and being associated to said image of said reference mark projected by said reference beam biased by said mechanical variations and producing electrical output signals corresponding to said mechanical variations; and

c. indicator means fed by said electrical output signals for indicating said mechanical variations.

4,071,773

PATCH CORD TIMER

Charles E. Scott, Noblesville, Ind., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed Aug. 18, 1976, Ser. No. 715,293
Int. Cl.[2] G08B 1/00
U.S. Cl. 307—141 **11 Claims**

1. A timer comprising:

a. power switching means for switching power on and off to the timer,

b. power supply means for regulating power to the timer responsive to said power switching means,

c. timing means for preselecting a maximum number of various time intervals responsive to said power supply means including a bank of individual switching means, at least two banks of individual impedance means, a plurality of patch cords and terminal means coupling at least one of said individual switching means to at least one impedance means from each of said banks of individual impedance means whereby at least one of said individual switching means has a preselected timing interval, and capacitance

means connected in series to said banks of individual impedance means, and

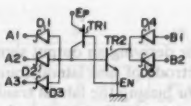
d. power turn-off means responsive to said timing means to de-energize said power switching means.

4,071,774

INTEGRATED INJECTION LOGIC WITH BOTH FAN IN AND FAN OUT SCHOTTKY DIODES, SERIALLY CONNECTED BETWEEN STAGES

Yukuya Tokumaru, and Masanori Nakai, both of Yokohama, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed Dec. 24, 1975, Ser. No. 644,085
Int. Cl.[2] H01L *27/04*
U.S. Cl. 307—215 **4 Claims**



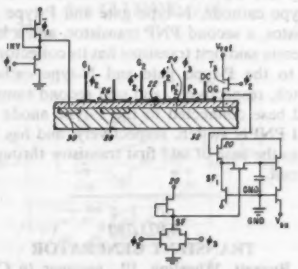
1. A semiconductor circuit having a plurality of stages, each stage comprising at least one output terminal, at least one input terminal, a first transistor having an emitter connected to a power source, and collector connected to said input terminal through a first diode and a second transistor having conductivity type opposite to that of said first transistor and including an emitter and base respectively connected to the base and collector of said first transistor and at least one collector connected to said output terminal through a second diode, the output terminal of one of said stages being connected to the input terminal of a succeeding stage.

4,071,775

CHARGE COUPLED DIFFERENTIAL AMPLIFIER FOR TRANSVERSAL FILTER

Charles Robert Hewes, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 2, 1976, Ser. No. 672,939
Int. Cl.[2] G11C *19/28*; H01L *29/78*; H03H *7/28*
U.S. Cl. 307—221 D **15 Claims**



1. A charge coupled device transversal filter comprising:

a. a semiconductor substrate having an insulating layer on one surface thereof;

b. charge carrier source means in said substrate for injecting signal charge packets into said substrate in response to a sampled analog voltage signal $v_{in}(nTc)$ where Tc is the sampling period;

c. a plurality of charge transfer electrode means on said insulating layer and overlying a signal propagation channel defined in said substrate for propagating said signal charge packets down said channel in response to clock signals applied thereto, said electrode means including N split electrodes having first and second sections over preselected portions of said channel, each of said split electrodes defining a weighting coefficient *hm;*

d. a second charge carrier source in said substrate;

e. first and second gate electrodes on said insulating layer and spaced apart from each other, said first gate electrode lying over a substrate region adjacent to said second charge carrier source;

f. coupling means electrically coupling said first gate electrode to said first sections of said split electrodes, and coupling said second gate electrode to said second sections of said split electrodes;

g. a storage electrode on said insulating layer between said first and second gate electrodes;

h. clock means for selectively applying clock pulses to said second charge carrier source and said first and second gate electrodes to inject convolution charge packets proportional to

$$\sum_{m=1}^{N} v_{in}(nTc-mTc)hm$$

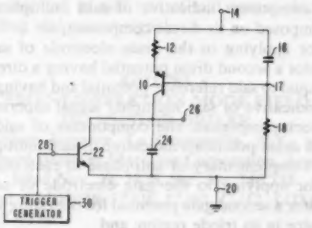
into said substrate under said second gate electrode and said storage gate electrode.

4,071,776

SAWTOOTH VOLTAGE GENERATOR FOR CONSTANT AMPLITUDE SAWTOOTH WAVEFORM FROM VARYING FREQUENCY CONTROL SIGNAL

Robert Haynes Isham, II, Piscataway, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 19, 1976, Ser. No. 715,852
Int. Cl.[2] H03K *4/08*
U.S. Cl. 307—228 **6 Claims**



1. A circuit for producing sawtooth voltage waves having substantially constant amplitude in response to a command signal whose frequency may vary comprising, in combination:

first and second voltage terminals across which an operating voltage may be applied;

an amplifier having input, output and common terminals;

first resistance means for coupling the first voltage terminal to the amplifier common terminal via a direct current conductivity path;

second resistance means connecting the amplifier input terminal to the second voltage terminal for providing effectively the sole direct current path to or from the amplifier input terminal;

a first energy storage element connected between the amplifier input terminal and one of the voltage terminals;

a second energy storage element connected between the amplifier output terminal and one of the voltage terminals; and

switching means having a conduction path and a control electrode, said conduction path connected in parallel with

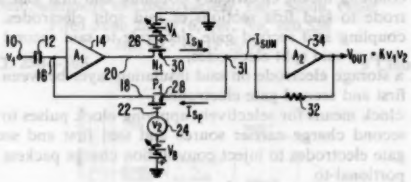
the second energy storage element, the control electrode connected to a source of command signals the frequency of which varies.

4,071,777

FOUR-QUADRANT MULTIPLIER

Eric Peter Herrmann, Bound Brook, N.J., assignor to RCA Corporation, New York, N.Y.

Filed July 6, 1976, Ser. No. 702,403
Int. Cl.² G06G 7/12
U.S. Cl. 307—229 **8 Claims**



1. A multiplier for developing a product signal proportional to a multiplicand signal multiplied by multiplier signal comprising, in combination:

first and second field effect transistors respectively of first and second conductivity types complementary to each other, each having source and drain electrodes and a channel therebetween and having a gate electrode;

means for maintaining the source electrodes of said first and second transistors at a reference potential;

means for applying to the drain electrode of said first transistor a first drain potential having a direct component equal to said reference potential and having a component indicative of said multiplier signal superimposed on its direct component;

means for applying to the gate electrode of said first transistor a first gate potential having a direct component for operating said first transistor in its triode region and having a component indicative of said multiplicand signal superimposed on its direct component;

means for applying to the drain electrode of said second transistor a second drain potential having a direct component equal to said reference potential and having a component indicative of said multiplier signal superimposed on its direct component, the components of said first and second drain potentials indicative of said multiplier signal being complementary or anti-phase to each other;

means for applying to the gate electrode of said second transistor a second gate potential for operating said second transistor in its triode region; and

means connected to additively combine the currents flowing in the channels of said first and second field effect transistors responsive to the potentials applied to them to derive said product signal substantially free of first-order and second-order multiplier signal terms.

4,071,778

ANALOG OPERATION CIRCUIT USING A MULTI-COLLECTOR LATERAL TRANSISTOR

Yoshiyuki Nakagomi, Kodaira, Japan, assignor to Hitachi, Ltd., Japan

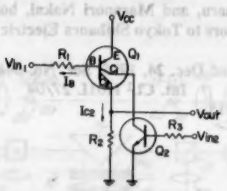
Filed July 13, 1976, Ser. No. 704,991
Claims priority, application Japan, July 30, 1975, 50-91915
Int. Cl.² G06G 7/12; H01L 29/72
U.S. Cl. 307—229 **6 Claims**

1. An analog operation circuit comprising:

a lateral transistor element having an emitter region having an emitter electrode, a base region having a base electrode, a first collector region having a first collector electrode and formed between said emitter region and part of said base region, and a second collector region having a second collector electrode and formed outside the first collector region between the outside of said first collector region and part of said base region, said emitter electrode being supplied with an operating voltage;

means for applying a first input signal to the base electrode of said lateral transistor;

means for applying a second input signal to the first collector electrode of said lateral transistor;



output means for deriving an output signal from the second collector electrode of said lateral transistor; and

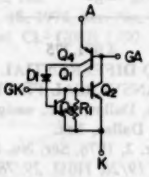
biasing means for biasing the lateral transistor element using said first collector electrode as its sole collector to operatein the transition region between the active region and the saturation region of its operating characteristics.

4,071,779

SEMICONDUCTOR SWITCH

Mitsuru Kawanami; Ichiro Ohhinata, both of Yokohama, and Shinzi Okuhara, Fujisawa, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 17, 1976, Ser. No. 715,156
Claims priority, application Japan, Aug. 20, 1975, 50-100190
Int. Cl.² H03K 17/02, 17/60
U.S. Cl. 307—255 **21 Claims**



1. A semiconductor switch comprising a PNPN switch of an equivalently four-layered PNPN structure including a P-type anode, N-type cathode, N-type gate and P-type gate, a first NPN transistor, a second PNP transistor, and a level shifting circuit, wherein said first transistor has its collector and emitter connected to the P-type gate and N-type cathode of said PNPN switch, respectively, and said second transistor has its emitter and base connected to the P-type anode and N-type gate of said PNPN switch, respectively, and has its collector connected to the base of said first transistor through said level shifting circuit.

4,071,780

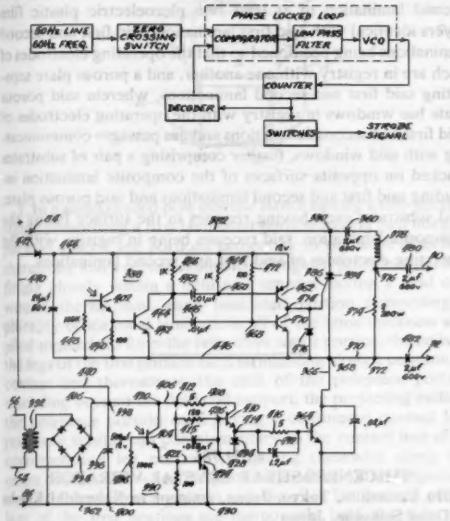
TRANSIENT GENERATOR

Ronald H. Burnett, Wheeling, Ill., assignor to Corcom, Inc., Chicago, Ill.

Filed Sept. 10, 1976, Ser. No. 722,282
Int. Cl.² H03K 5/15, 5/01, 3/35
U.S. Cl. 307—262 **19 Claims**

15. A transient generator for producing a series of transients at any desired repetition rate within a range, comprising a series discharge circuit which includes a capacitor, a pair of output terminals, and the anode and cathode of a silicon controlled rectifier; DC circuit means for charging said capacitor,

means for supplying triggering pulses to said silicon controlled rectifier at said rate, and means for interrupting said charging circuit during capacitor discharge and thereafter restoring said circuit, said pulse supplying means including a phase locked loop having a reference input terminal, a feedback input terminal, and a pulse output, a reference frequency source for supplying a reference frequency to the reference input terminal of said phase locked loop, pulse counting means connected to the



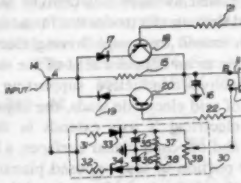
output of said phase locked loop adjustable to any count within the range of said counting means, circuit means for delivering a synchronizing pulse from said counting means to the feedback input terminal of said phase locked loop and for resetting said counting means upon the arrival at said count, and circuit means connected to the output of said phase locked loop for delivering the pulses thereof to the gate of said silicon controlled rectifier.

4,071,781

PULSE DURATION CORRECTION CIRCUIT

Isaac Kayalioglu, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Nov. 15, 1976, Ser. No. 741,791
Int. Cl.[2] H03K *1/18*
U.S. Cl. 307—265 **7 Claims**



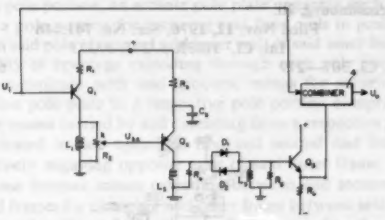
1. A pulse duration correcting circuit comprising: a comparator having two inputs, a predetermined one receiving incoming pulses through resistive circuit means, and the other receiving the incoming pulses through a bipolar averaging circuit; the output of said comparator being the output of the pulse correcting circuit; and said resistive circuit means comprising two switching transistors of opposite polarity shunted to a resistor connecting the incoming pulses with said one predetermined input of said comparator, and said switching transistors being controlled at their electrodes by the output of said comparator.

4,071,782

PHASELESS EQUALIZER

Nikola Vidovic, Santa Clara, Calif., assignor to International Video Corporation, Sunnyvale, Calif.

Filed June 28, 1976, Ser. No. 700,483
Int. Cl.[2] H03K *5/01*
U.S. Cl. 307—268 **28 Claims**



1. Apparatus for generating an output signal corresponding to the double differentiation of the input signal without introducing phase shift comprising

amplifier means including a transistor having a control electrode and a first and a second output electrode,

means including a first differentiating circuit for applying said input signal to said control electrode, said first differentiating circuit having a selectable time constant,

means including a second differentiating circuit connected between one of said output electrodes and AC ground,

means including a circuit having a selectable time constant connected between the other of said output electrodes and AC ground, the time constant of said circuit being substantially equal to the time constant of said first differentiating circuit, and

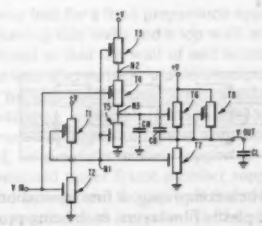
means connected to said one of said output electrodes for providing said output signal.

4,071,783

ENHANCEMENT/DEPLETION MODE FIELD EFFECT TRANSISTOR DRIVER

Ronald William Knepper, La Grangeville, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 29, 1976, Ser. No. 745,735
Int. Cl.[2] H03K *17/04, 17/60, 17/12, 3/353*
U.S. Cl. 307—270 **13 Claims**



1. An improved driver circuit comprising:

a first source of potential;

a second source of potential;

a push-pull output circuit, having first and second inputs and an output, connected between said first and second sources of potential;

said first input of said push-pull output circuit adapted to receive an input signal; and

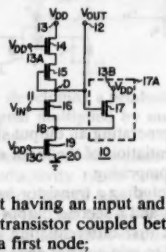
a circuit path, including a series connected capacitance and first field effect transistor, connecting said second input and said output, said first field effect transistor having a gating electrode for receiving one phase of said input signal while said first input of said push-pull output circuit adapted to receive an input signal receives another phase of said input signal.

4,071,784

MOS INPUT BUFFER WITH HYSTERESIS

Heinz Bernhard Maeder, Weinfelden, Switzerland, and Gene Arnold Schriber, Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 12, 1976, Ser. No. 741,446
Int. Cl.[2] H03K *3/295, 3/353*
U.S. Cl. 307—279 **6 Claims**



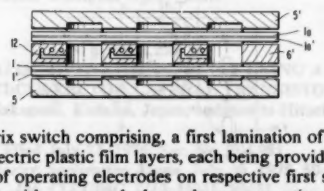
1. An input circuit having an input and output comprising:
a first field effect transistor coupled between a first voltage conductor and a first node;
a second field effect transistor coupled between said first node and said output;
a third field effect transistor coupled between said output and a second node and having its gate coupled to said input;
a fourth field effect transistor coupled between a second voltage conductor and said second node, and having its gate coupled to said first voltage conductor; and
a fifth field effect transistor coupled between said first voltage conductor and said second node and having its gate coupled to said output, said second, fourth, and fifth field effect transistors being depletion mode.

4,071,785

LAMINATED PIEZOELECTRIC MATRIX SWITCH

Masafumi Yoshida, and Hiroshi Obara, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 30, 1976, Ser. No. 681,934
Claims priority, application Japan, May 2, 1975, 50-53727
Int. Cl.[2] H01L *41/04*
U.S. Cl. 310—331 **1 Claim**



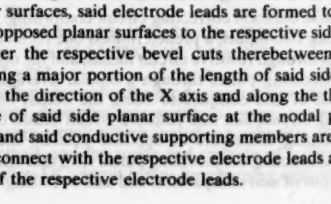
1. A matrix switch comprising, a first lamination of at least two piezoelectric plastic film layers, each being provided with a plurality of operating electrodes on respective first surfaces thereof and with a ground electrode on respective second surfaces thereof, said ground electrode covering at least areas corresponding to those of said operating electrodes on each of said first surfaces, said operating electrodes on one of said film layers being arranged in parallel rows, said operating electrodes in each row being electrically connected to one another, said operating electrodes on the other of said film layers being arranged in parallel columns, said operating electrodes in each column being electrically connected to one another, said film layers being positioned in said lamination such that said operating electrodes of said one film layer are positioned correspondingly to said operating electrodes of said the other film layer respectively so that each of said rows crosses said columns at positions of said operating electrodes, and said crossing points are used as key operating points, said ground electrodes comprise physically distinct ground electrodes, one for each said film layer, facing and in direct contact with each other, a second lamination of at least two piezoelectric plastic film layers identical with said first lamination, said first and second laminations being positioned so that the operating electrodes of each are in registry with one another, and a porous plate separating said first and second laminations, wherein said porous plate has windows in registry with the operating electrodes of said first and second laminations and gas passages communicating with said windows, further comprising a pair of substrates stacked on opposite surfaces of the composite lamination including said first and second laminations and said porous plate, said substrates each having recesses in the surface facing the composite lamination, said recesses being in registry with the operating electrodes of said first and second laminations.

4,071,786

THICKNESS-SHEAR CRYSTAL VIBRATOR

Shiro Yamashita, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Mar. 31, 1976, Ser. No. 672,460
Claims priority, application Japan, Apr. 8, 1975, 50-47196[U]
Int. Cl.[2] H01L *41/04*
U.S. Cl. 310—361 **4 Claims**

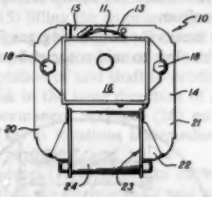


1. In a thickness-shear mode crystal vibrator including a pair of opposed planar surfaces having a pair of driving electrodes each formed on a respective one of said opposed planar surfaces, a pair of side planar surfaces adjacent to said planar surfaces on which said driving electrodes are formed, a pair of electrode leads which extend from said driving electrodes to the thickness center line or an adjacent area of the side planar surfaces, and a respective conductive supporting member connected with each of said electrode leads, the improvement wherein the crystal electrical X axis extends in the length direction of said side and opposed planar surfaces, a bevel cut is formed at the edge portion of said opposed planar surfaces where said driving electrode leads are formed and the adjacent side planar surfaces, said electrode leads are formed to extend from said opposed planar surfaces to the respective side planar surface over the respective bevel cuts therebetween and to extend along a major portion of the length of said side planar surfaces in the direction of the X axis and along the thickness center line of said side planar surface at the nodal plane of vibration, and said conductive supporting members are dimensioned to connect with the respective electrode leads at opposite ends of the respective electrode leads.

4,071,787
WELDED STATOR FOR ELECTRIC MOTORS

Max E. Lautner, Watertown, and Bernard J. West, Chaumont, both of N.Y., assignors to Gould Inc., Rolling Meadows, Ill.

Filed June 3, 1976, Ser. No. 692,448
Int. Cl.[2] H02K *15/00*
U.S. Cl. 310—42 8 Claims

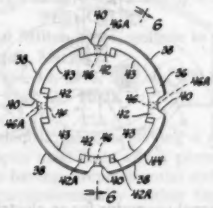


1. In a small shaded pole electric motor having a two-portion stator comprising a first laminated portion having two integral parallel spaced leg portions projecting in the same direction therefrom, and a second laminated elongated polepiece portion fitting closely within a field coil support having a field coil wound therearound, each laminated portion comprising a plurality of identical laminations all of the same thickness and piled together to form the respective stator portion, the ends of the legs of the first portion each terminating along a continuous contact line thereacross, the ends of the polepiece portion extending beyond the field coil support, the projecting ends of the polepiece portion each having a continuous contact line reversely similar and complementary to the contact line of its corresponding leg portion for mating therewith along the entire contact line when the piled laminations of the projecting ends of the polepiece portion and the piled laminations of the legs of the first portions are temporarily held together and advanced toward one another in a direction diammetrically opposite to the direction in which the legs project while the piled laminations are guided on a common flat surface on which the laminations lie lowermost face down, each contact line for each leg and its corresponding polepiece end lying along a line which continually diverges laterally and outwardly endwise of the leg at an angle to the contact line between the other leg and its corresponding polepiece end, whereby contact between each leg and corresponding polepiece end is made instantaneously all along the contact lines, each leg and its corresponding polepiece end being thereafter strip welded together at the outer end of their contact line, the strip weld extending across the edges of the laminations of both portions for securing together the laminations of both portions as well as securing the portions together.

4,071,788
DYNAMOELECTRIC MACHINE FIELD ASSEMBLY

Ronald A. Martin, Anderson; Charles R. Ashton, Middletown, and Richard D. Watson, Chesterfield, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 14, 1976, Ser. No. 732,499
Int. Cl.[2] H02K *15/02*
U.S. Cl. 310—42 4 Claims

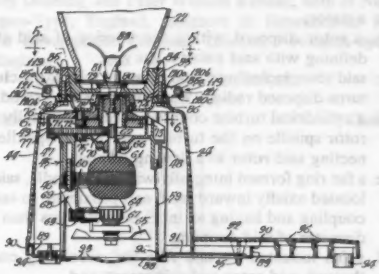


1. A field and housing assembly for a dynamoelectric machine comprising, a tubular outer frame member formed of magnetic material, a field assembly located within said outer tubular frame member, said field assembly including a unitary inner frame formed of magnetic material, said inner frame having an outer circumferentially extending wall defined by circumferentially spaced outer arcuate segments separated by circumferentially spaced axially extending grooves, said outer arcuate segments having a press fit with the inner wall of said outer frame, the inner wall of said inner frame being defined by circumferentially spaced inner arcuate segments separated by circumferentially spaced radially inwardly extending integral pole portions having arcuate end faces, said pole portions being aligned with said grooves, a field coil disposed about each integral pole portion, an arcuate pole plate engaging each end face of a pole portion for retaining said field coils in position between said pole plates and said inner wall of said inner frame, a plurality of openings extending through each pole portion that communicate with said grooves, means for securing a respective pole plate to a respective pole portion comprising fastener means carried by and extending from a respective pole plate located in said openings, first and second end frames respectively engaging opposite ends of said outer frame, and end frame fastener means extending between and secured to said end frames for clamping said outer frame between said end frames, each said end frame fastener means extending through a respective space defined by a respective groove wall and an inner wall of said outer frame.

4,071,789
MULTI-PURPOSE KITCHEN APPLIANCE

Peter Jacob Ernster, Glendale; William Joseph Collins, Milwaukee, and George Henry Schaefer, Wauwatosa, all of Wis., assignors to Oster Corporation, Milwaukee, Wis.

Division of Ser. No. 478,905, June 13, 1974, Pat. No. 3,951,351.
This application Feb. 26, 1976, Ser. No. 661,721
Int. Cl.[2] H02K *7/14*
U.S. Cl. 310—50 5 Claims



1. A power unit for a food preparation appliance comprising a housing having side walls and a top wall, attachment support means fastened to said top wall of said housing to receive and support various alternatively usable attachments which are to be driven by said power unit, a motor enclosed within said housing including an armature carried by a shaft, said shaft being journaled by upper and lower armature bearings, a laminated field, commutator means supported on said armature shaft, a combined upper frame member supported within said power unit housing from the top wall thereof, said upper frame member supporting said laminated field and said upper armature bearing, a lower frame member supported by said upper frame member, said lower frame member supporting said lower armature bearing and commutator brushes in engagement with said commutator means, assembly means mounting said upper frame member in said housing to permit relative movement between said motor and said housing to obtain alignment of said motor and gearing assembly with said attachment support means, said upper frame member being formed

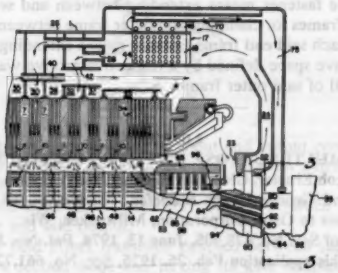
with a recess within which reduction gearing is enclosed, said shaft extending into said recess into driving engagement with said reduction gearing and having coupling means extending through said top wall to provide a high speed output shaft, said reduction gearing having a low speed output shaft which is concentric with and surrounds said high speed output shaft, said high speed output shaft having a speed on the order of 18,000 RPM and said low speed output shaft having an output speed on the order of 250 RPM.

4,071,790

COOLING ARRANGEMENT FOR ROTOR END TURNS OF REVERSE FLOW COOLED DYNAMOELECTRIC MACHINES

William L. Darby, Scotia; Robert H. Monz, and Stephen J. Molis, both of Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed June 1, 1976, Ser. No. 691,360
Int. Cl.[2] H02K *9/00*
U.S. Cl. 310—59 **3 Claims**



1. A reverse flow cooled dynamoelectric machine comprising:

a. a stator;

b. a rotor disposed within the interior of said stator and defining with said stator a gas gap;

c. said rotor including a spindle and a winding including end turns disposed radially outward from said spindle;

d. a cylindrical turbine coupling formed integrally with said rotor spindle on the turbine end of said spindle for connecting said rotor to a driving turbine;

e. a fan ring formed integrally with said spindle, said fan ring located axially inward from and proximate to said turbine coupling and having an inner diameter less than the outer diameter of said coupling;

f. a fan mounted on said ring for circulating cooling gas through said rotor and said stator; and

g. a plurality of passages extending through said fan ring and a portion of said spindle for the conduction of cooling gas to said end turns, said passages extending in a direction at an angle to the axis of said rotor and corresponding to the most practicable extent to the vector sum of the axial and tangential components of the velocity of the cooling gas entering said passages to minimize pressure losses in the flow of cooling gas through said passages.

4,071,791

REVERSE FLOW COOLED DYNAMOELECTRIC MACHINES WITH NOVEL COOLING SYSTEM

Anthony F. Armor, Schenectady, and Casmer P. Stanwick, Amsterdam, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed June 1, 1976, Ser. No. 691,365
Int. Cl.[2] H02K *9/00*
U.S. Cl. 310—59 **5 Claims**

1. A reverse flow cooled dynamoelectric machine comprising:

a. a gas-tight casing containing cooling gas;

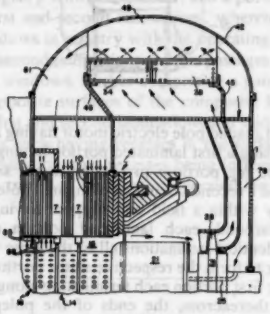
b. a stator core including radial passages for flow of gas;

c. a rotor defining a gas gap with the stator core and having a body portion and an end turn portion;

d. fan means mounted on said rotor for circulating cooling gas from said gas gap to gas coolers;

e. first and second gas coolers mounted in said casing in side-by-side relationship, said gas coolers communicating with an outlet of said fan means to receive and cool gas pumped therefrom;

f. first conduit means for conducting gas from both said first and second coolers to said rotor end turn portion;



g. second conduit means conducting gas from both said first and second coolers to said stator cooling passages and said rotor body portion; and

h. baffle means disposed in said casing in abutting spaced relationship with both said coolers and extending radially outward from said coolers to an inner wall of said casing, said baffle means being shaped to direct a portion of the gas cooled by each of said coolers to both first and second conduit means, thereby ensuring a flow of cooling gas both to said stator and said body portion of said rotor and to said end turn portion of said rotor with only one of said coolers operating.

4,071,792

ENGINE IGNITION TIMING SIGNAL GENERATOR HAVING A REDUCED NUMBER OF PERMANENT MAGNETS

Harald Kalippke, Hohenacker; Richard Gerber, and Karl Ehrmann, both of Stuttgart, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Nov. 3, 1976, Ser. No. 738,441
Claims priority, application Germany, Nov. 25, 1975, 2552754
Int. Cl.[2] H02K *21/22*
U.S. Cl. 310—70 R **5 Claims**

1. A timing signal generator for an electrical ignition system of an internal combustion engine having a rotor in the form of a pole wheel in which permanently magnetized magnet ele-

ments are set, which rotor is mounted on a shaft for rotation within a stator having an electrically transmitting element (21) responsive to the rotation of the rotor past the transmitting element for producing a signal in a control circuit of said ignition system, in which there is the improvement that said rotor comprises:

a disk-like matrix body (15) of non-magnetic material centered on said shaft (13) for carrying permanent magnets (16) and pole pieces (17,18,19,20) embedded therein, said matrix body (15) filling the angular intervals between said permanent magnets, having a cylindrical surface defining its periphery and being mounted on said shaft in a way that enables rotation of said shaft to produce coaxial rotation of said disk in the same direction of rotation;

a plurality of permanent magnets (16) embedded in said matrix body (15) at locations intermediate between said shaft and said periphery, and

a group of pole pieces (17,18,19,20) for each of said magnets (16) embedded in the periphery of said matrix body (15) and each connected to a pole of the magnet by an elongated magnetically conducting body embedded in said matrix body.

4,071,793

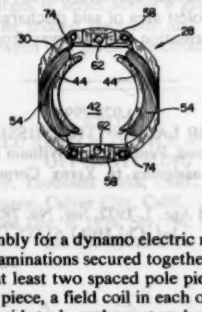
FIELD SUBASSEMBLY FOR ELECTRIC MOTORS

Denis Charles Cox, Niedernhausen, Germany, assignor to The Black and Decker Manufacturing Company, Towson, Md.

Continuation of Ser. No. 711,902, Aug. 5, 1976, abandoned, which is a continuation of Ser. No. 590,076, June 25, 1975, abandoned. This application Mar. 23, 1977, Ser. No. 780,521

Int. Cl.² H02K *11/00*

U.S. Cl. 310—71 **24 Claims**



1. A stator assembly for a dynamo electric machine comprising a plurality of laminations secured together to form a stack, the stack having at least two spaced pole pieces and a pair of coil slots per pole piece, a field coil in each one of the pairs of slots, apertures in said stack, each aperture being located in one of the regions between adjacent pole pieces, and electrically insulating terminal block positioned on said stack, each of said blocks being associated with one of said apertures, and each of said blocks having an external configuration corresponding to the region between said pole pieces and such that said blocks do not extend either externally of said stack in a radial direction or within said stack.

4,071,794

DC MOTOR-WITH PERMANENT MAGNET RETAINING STRUCTURE

Roy C. Schoen, West Milton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 10, 1975, Ser. No. 630,213

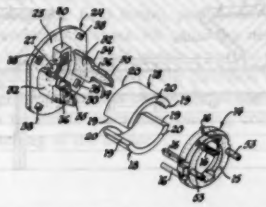
Int. Cl.² H02K *21/26*

U.S. Cl. 310—154 **4 Claims**

1. In a dynamoelectric machine having a cylindrical case with closed and open axial ends and a plurality of arcuate permanent magnets having circumferential and axial ends and being positioned circumferentially within the case, magnet retention apparatus adapted for easy drop-in assembly from the open end of the case and comprising:

a magnet retention member comprising a ring disposed within the case adjacent its closed end and a plurality of resilient arms extending axially therefrom toward the open end of the case, the arms comprising a pair for each permanent magnet, each pair of arms being adapted to receive the associated permanent magnet inserted axially therebetween and to abut opposite circumferential ends of the magnet inserted,

an end cover adapted to close the open end of the case, the end cover including a plurality of fingers projecting axially inward therefrom for insertion between adjacent pairs of arms and engagement with one arm of each adjacent



pair, each finger having a tapered end for aid in insertion between the arms and a constant-width portion effective to compress the resilient arms against the magnet circumferential ends and thereby retain the magnets radially and circumferentially between the arms and case, the end cover further including a plurality of shoulders effective to engage the permanent magnets on axial ends thereof and bias the permanent magnets with their opposite axial ends into engagement with the ring, whereby the permanent magnets are axially retained between the end cover and the magnet retention member.

4,071,795

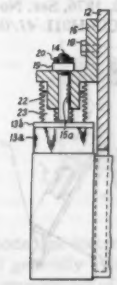
BRUSH GEAR FOR ELECTRICAL MACHINERY

Peter Philip Dobbing, and Peter William Kendall, both of Newcastle-upon-Tyne, England, assignors to International Research & Development Company Limited, Newcastle-upon-Tyne, England

Filed Sept. 2, 1975, Ser. No. 609,185

Int. Cl.² H02K *13/00*

U.S. Cl. 310—219 **7 Claims**

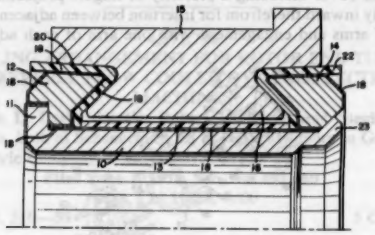


1. Brush gear for electrical machinery comprising a current transfer brush composed for resilient fibres, a support for said brush, means mounting said brush on said support for movement towards and away from a current transfer surface, positive drive adjusting means for effecting said movement of the brush relative to the support, a flexible housing sealed to the brush and the support and a quantity of liquid metal enclosed in said housing, said housing permitting said movement of said brush relative to said support and said liquid metal being in electrical contact with the brush and with the support throughout said movement for the flow of current between the brush and the support.

4,071,796
DOUBLE INSULATED COMMUTATOR

Russell A. Nippert, Delaware, Ohio, assignor to The Nippert Company, Delaware, Ohio

Continuation of Ser. No. 568,503, April 16, 1975, abandoned.
This application June 11, 1976, Ser. No. 695,013
Int. Cl.[2] H02K *13/04*
U.S. Cl. 310—236 4 Claims

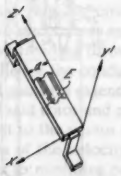


1. A commutator for an electric motor comprising an assembly with a steel shell having an integral shoulder against which there fits a V-shaped end ring at one end, a second V-shaped end ring at the opposite end of said shell, said V-shaped end rings forming annular dovetail grooves, said shell and said end rings having an insulating coating of resin deposited thereon as a thin uniform layer over their entire outer surface, said resin coating being in a thermoset condition and providing a complete insulating layer, a separate second insulating layer of laminated sheet material overlying said resin coating on said end rings and on said shell, a plurality of commutator bars insulated from each other and having dovetails fitting into said grooves and held in place by said end rings, and an end of said shell engaging said second V-shaped end ring to thereby lock said commutator bars in said assembly.

4,071,797
QUARTZ PIEZO-ELECTRIC ELEMENT VIBRATING IN A COUPLED MODE

Alphonse Ernst Zumsteg; Jean Engdahl, both of Bienne, and Raymond Huguenin, Port, all of Switzerland, assignors to Societe Suisse pour l'Industrie Horlogere Management Services S.A., Bienne, Switzerland

Filed Jan. 20, 1976, Ser. No. 650,643
Int. Cl.[2] H01L *41/04*
U.S. Cl. 310—361 9 Claims



1. A piezo-electric resonator in rectangular bar form cut from a quartz crystal in a rotated Y orientation of 34°48′ ± 20′ and having its greatest dimension along Z′ (YZW 34°48′ ± 20′ arranged to vibrate in a mode which is the resultant of coupling of a thickness shear (XY′) mode and a flexural (XY′) mode, the width (X)–thickness(Y′) ratio of the resonator being selected from the following ranges:

between 1.1 and 1.9 for the second flexure harmonic
between 2.2 and 3.6 for the fourth flexure harmonic
between 3.6 and 5.3 for the sixth flexure harmonic
between 5.1 and 6.8 for the eighth flexure harmonic said quartz crystal being provided with electrodes on its opposed XZ′ surfaces, such electrodes extending over the entire width X of the resonator but having a length in the Z′ direction less than the length of the resonator thereby to establish an energy trapping zone within the portion of the resonator between the electrodes.

4,071,798
SODIUM VAPOR LAMP WITH EMISSION APERTURE

Thomas J. Hammond, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 1, 1977, Ser. No. 783,905
Int. Cl.[2] H01J *61/52*
U.S. Cl. 313—18 3 Claims

1. A sodium vapor discharge lamp comprising an inner discharge tube within an outer envelope,

said outer envelope having on the surface thereof a light-reflective coating defining a light aperture for the transmission of visible light in a desired direction and an infrared-reflective coating defining a heat aperture for the transmission of infrared radiation,

said heat aperture disposed on an area of said outer envelope away from said light aperture, thereby to correspondingly locate the coolest area of said discharge tube, where any sodium condensation occurs, away from said light aperture.

4,071,799
SODIUM VAPOR LAMP WITH EMISSION APERTURE

Thomas J. Hammond, Penfield, and William L. Lama, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 1, 1977, Ser. No. 783,904
Int. Cl.[2] H01J *61/52*
U.S. Cl. 313—44 3 Claims

1. A sodium vapor discharge lamp including a sodium vapor discharge tube and a light reflector extending along and partially surrounding said discharge tube,

said light reflector defining a light source aperture for the transmission therethrough of visible light in a desired direction,

said light reflector being in contact with said discharge tube on a surface thereof away from said light aperture, said contact effecting a thermal coupling of said discharge tube and said light reflector for the conduction of heat through said thermal coupling from said discharge tube to said light reflector, thereby to locate the coolest area of said discharge tube at the area of said contact, where any

sodium condensation occurs, away from said light aperture.

4,071,800

THREE ELECTRODE ARC PLASMA FLAME IGNITION DEVICES

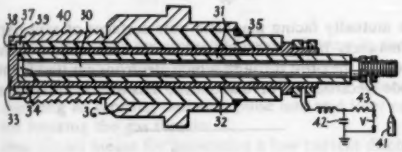
Francis James Atkins, Leamington Spa, England, assignor to Associated Engineering Limited, Leamington Spa, England

Filed Nov. 15, 1976, Ser. No. 741,696

Claims priority, application United Kingdom, Dec. 5, 1975, 50092/75

Int. Cl.[2] H01T *13/20, 13/46*

U.S. Cl. 313—123 4 Claims



1. A three electrode arc plasma flame ignition device having an outer first electrode surrounding an intermediate second electrode and insulation between said first and second electrodes, a third electrode surrounded by said second electrode and insulation between said second and third electrodes, said first electrode having an end part which surrounds said second electrode and defines with it an annular gap across which a potential from a first source connected to said first and second electrodes is discharged when a higher potential from a second source is applied to said third electrode so that said higher potential discharges in series across a gap between the third electrode and the second electrode and radially across said annular gap between said second electrode and said first electrode.

4,071,801

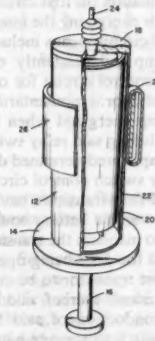
CROSSED-FIELD SWITCH DEVICE AND METHOD FOR OFF-SWITCHING

Robin J. Harvey, Thousand Oaks, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 9, 1976, Ser. No. 749,125

Int. Cl.[2] H01J *1/50*

U.S. Cl. 313—154 9 Claims



1. A crossed-field switch device comprising:

an anode electrode;

a cathode electrode spaced from said anode electrode and defining an interelectrode space therebetween so that an electric potential can be applied between said electrodes to define an electric field across said interelectrode space, said interelectrode space being a continuous closed path and being arranged to contain a selected gas under a selected pressure;

main magnetic field means for producing a magnetic field in the interelectrode space at an angle with respect to the electric field and at an angle with respect to the continuous closed path in the interelectrode space so that in the presence of the main magnetic field and the electric field electrons are caused to spiral through the interelectrode space in a sufficiently long closed path before intercepting the anode to cause cascading ionizing collisions to cause electric conduction between said electrodes, the improvement comprising:

auxiliary magnetic field means positioned with respect to said interelectrode space for causing a net distorted portion of the magnetic field in only a portion of the interelectrode space in the closed path direction so that the distorted portion prevents continuity of the closed electron path to terminate cascading ionizing collisions to cause off-switching of the device.

4,071,802

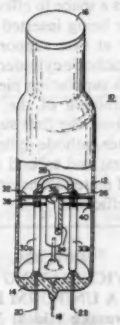
HOLLOW-CATHODE SPECTRAL LIGHT SOURCE WITH MEANS TO PREVENT HIGH VOLTAGE ARCING

George K. Yamasaki, Horseheads, N.Y., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 19, 1976, Ser. No. 687,839

Int. Cl.[2] H01J *61/04*

U.S. Cl. 313—209 5 Claims

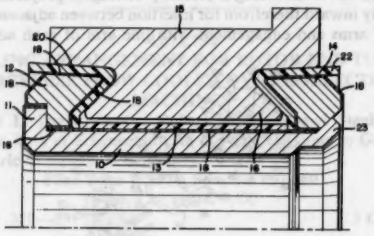


1. A hollow-cathode type spectral light source comprising a hermetically sealed generally cylindrical envelope at least a portion of which is transmissive of the spectral light generated, a selected fill gas within the envelope defined space, a hollow cathode disposed within the space aligned with longitudinal axis of the envelope, an anode spaced from the hollowed end of the hollow cathode, at least one insulating disc disposed between the anode and the exterior portion of the hollow cathode with a central aperture provided through the disc aligned with the hollow in the hollow cathode, which insulating disc has a diameter which is slightly less than the cylindrical envelope diameter, the improvement wherein a resilient, annular, highvoltage shield member is disposed about the insulating disc between the disc and the envelope to prevent high-voltage breakdown between the anode and the cathode exterior.

4,071,796
DOUBLE INSULATED COMMUTATOR

Russell A. Nippert, Delaware, Ohio, assignor to The Nippert Company, Delaware, Ohio

Continuation of Ser. No. 568,503, April 16, 1975, abandoned.
This application June 11, 1976, Ser. No. 695,013
Int. Cl.[2] H02K *13/04*
U.S. Cl. 310—236 4 Claims

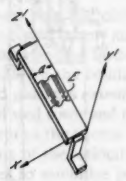


1. A commutator for an electric motor comprising an assembly with a steel shell having an integral shoulder against which there fits a V-shaped end ring at one end, a second V-shaped end ring at the opposite end of said shell, said V-shaped end rings forming annular dovetail grooves, said shell and said end rings having an insulating coating of resin deposited thereon as a thin uniform layer over their entire outer surface, said resin coating being in a thermoset condition and providing a complete insulating layer, a separate second insulating layer of laminated sheet material overlying said resin coating on said end rings and on said shell, a plurality of commutator bars insulated from each other and having dovetails fitting into said grooves and held in place by said end rings, and an end of said shell engaging said second V-shaped end ring to thereby lock said commutator bars in said assembly.

4,071,797
QUARTZ PIEZO-ELECTRIC ELEMENT VIBRATING IN A COUPLED MODE

Alphonse Ernst Zumsteg; Jean Engdahl, both of Bienne, and Raymond Huguenin, Port, all of Switzerland, assignors to Societe Suisse pour l'Industrie Horlogere Management Services S.A., Bienne, Switzerland

Filed Jan. 20, 1976, Ser. No. 650,643
Int. Cl.[2] H01L *41/04*
U.S. Cl. 310—361 9 Claims



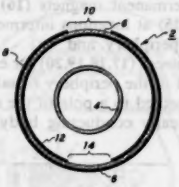
1. A piezo-electric resonator in rectangular bar form cut from a quartz crystal in a rotated Y orientation of 34°48′ ± 20′ and having its greatest dimension along Z′ (YZW 34°48′ ± 20′ arranged to vibrate in a mode which is the resultant of coupling of a thickness shear (XY′) mode and a flexural (XY′) mode, the width (X)–thickness(Y′) ratio of the resonator being selected from the following ranges:

between 1.1 and 1.9 for the second flexure harmonic
between 2.2 and 3.6 for the fourth flexure harmonic
between 3.6 and 5.3 for the sixth flexure harmonic
between 5.1 and 6.8 for the eighth flexure harmonic said quartz crystal being provided with electrodes on its opposed XZ′ surfaces, such electrodes extending over the entire width X of the resonator but having a length in the Z′ direction less than the length of the resonator thereby to establish an energy trapping zone within the portion of the resonator between the electrodes.

4,071,798
SODIUM VAPOR LAMP WITH EMISSION APERTURE

Thomas J. Hammond, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 1, 1977, Ser. No. 783,905
Int. Cl.[2] H01J *61/52*
U.S. Cl. 313—18 3 Claims



1. A sodium vapor discharge lamp comprising an inner discharge tube within an outer envelope,

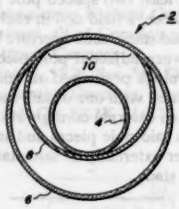
said outer envelope having on the surface thereof a light-reflective coating defining a light aperture for the transmission of visible light in a desired direction and an infra-red-reflective coating defining a heat aperture for the transmission of infrared radiation,

said heat aperture disposed on an area of said outer envelope away from said light aperture, thereby to correspondingly locate the coolest area of said discharge tube, where any sodium condensation occurs, away from said light aperture.

4,071,799
SODIUM VAPOR LAMP WITH EMISSION APERTURE

Thomas J. Hammond, Penfield, and William L. Lama, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 1, 1977, Ser. No. 783,904
Int. Cl.[2] H01J *61/52*
U.S. Cl. 313—44 3 Claims



1. A sodium vapor discharge lamp including a sodium vapor discharge tube and a light reflector extending along and partially surrounding said discharge tube,

said light reflector defining a light source aperture for the transmission therethrough of visible light in a desired direction,

said light reflector being in contact with said discharge tube on a surface thereof away from said light aperture, said contact effecting a thermal coupling of said discharge tube and said light reflector for the conduction of heat through said thermal coupling from said discharge tube to said light reflector, thereby to locate the coolest area of said discharge tube at the area of said contact, where any

sodium condensation occurs, away from said light aperture.

4,071,800

THREE ELECTRODE ARC PLASMA FLAME IGNITION DEVICES

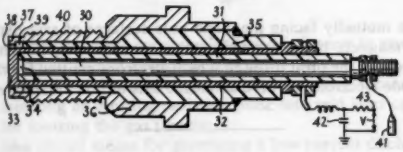
Francis James Atkins, Leamington Spa, England, assignor to Associated Engineering Limited, Leamington Spa, England

Filed Nov. 15, 1976, Ser. No. 741,696

Claims priority, application United Kingdom, Dec. 5, 1975, 50092/75

Int. Cl.² H01T *13/20, 13/46*

U.S. Cl. 313—123 **4 Claims**



1. A three electrode arc plasma flame ignition device having an outer first electrode surrounding an intermediate second electrode and insulation between said first and second electrodes, a third electrode surrounded by said second electrode and insulation between said second and third electrodes, said first electrode having an end part which surrounds said second electrode and defines with it an annular gap across which a potential from a first source connected to said first and second electrodes is discharged when a higher potential from a second source is applied to said third electrode so that said higher potential discharges in series across a gap between the third electrode and the second electrode and radially across said annular gap between said second electrode and said first electrode.

4,071,801

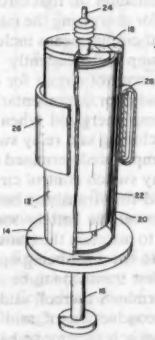
CROSSED-FIELD SWITCH DEVICE AND METHOD FOR OFF-SWITCHING

Robin J. Harvey, Thousand Oaks, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 9, 1976, Ser. No. 749,125

Int. Cl.² H01J *1/50*

U.S. Cl. 313—154 **9 Claims**



1. A crossed-field switch device comprising:

an anode electrode;

a cathode electrode spaced from said anode electrode and defining an interelectrode space therebetween so that an electric potential can be applied between said electrodes to define an electric field across said interelectrode space, said interelectrode space being a continuous closed path and being arranged to contain a selected gas under a selected pressure;

main magnetic field means for producing a magnetic field in the interelectrode space at an angle with respect to the electric field and at an angle with respect to the continuous closed path in the interelectrode space so that in the presence of the main magnetic field and the electric field electrons are caused to spiral through the interelectrode space in a sufficiently long closed path before intercepting the anode to cause cascading ionizing collisions to cause electric conduction between said electrodes, the improvement comprising:

auxiliary magnetic field means positioned with respect to said interelectrode space for causing a net distorted portion of the magnetic field in only a portion of the interelectrode space in the closed path direction so that the distorted portion prevents continuity of the closed electron path to terminate cascading ionizing collisions to cause off-switching of the device.

4,071,802

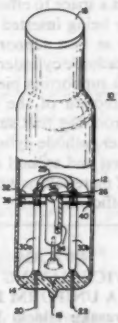
HOLLOW-CATHODE SPECTRAL LIGHT SOURCE WITH MEANS TO PREVENT HIGH VOLTAGE ARCING

George K. Yamasaki, Horseheads, N.Y., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 19, 1976, Ser. No. 687,839

Int. Cl.² H01J *61/04*

U.S. Cl. 313—209 **5 Claims**



1. A hollow-cathode type spectral light source comprising a hermetically sealed generally cylindrical envelope at least a portion of which is transmissive of the spectral light generated, a selected fill gas within the envelope defined space, a hollow cathode disposed within the space aligned with longitudinal axis of the envelope, an anode spaced from the hollowed end of the hollow cathode, at least one insulating disc disposed between the anode and the exterior portion of the hollow cathode with a central aperture provided through the disc aligned with the hollow in the hollow cathode, which insulating disc has a diameter which is slightly less than the cylindrical envelope diameter, the improvement wherein a resilient, annular, highvoltage shield member is disposed about the insulating disc between the disc and the envelope to prevent high-voltage breakdown between the anode and the cathode exterior.

4,071,803

ELECTRON GUN ASSEMBLY

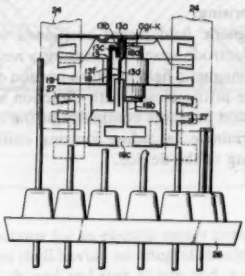
Yukio Takanashi, Hiratsuka; Fumiyuki Sato, Kawasaki, and Masanori Shinpo, Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Sept. 17, 1975, Ser. No. 613,975

Claims priority, application Japan, Sept. 19, 1974, 49-107967; July 18, 1975, 50-99773[U]

Int. Cl.[2] H01J *29/02, 29/50*

U.S. Cl. 313—409 9 Claims



1. An electron gun assembly comprising at least one electron gun unit constituted by a cathode electrode assembly having an inner cathode cylinder, a heater located in said inner cathode cylinder, and an outer cathode cylinder coaxially supporting the inner cathode cylinder; a plurality of grid electrodes sequentially arranged coaxially with the cathode electrode assembly; electrode supporting pieces for supporting the cathode and grid electrodes, the electode supporting pieces being fitted to one or more insulating support pillars, the inner cathode cylinder being supported to the tip end portion of the outer cathode cylinder by a plurality of supporting strips so that the tip portion of said inner cathode cylinder is projected from the tip end of the outer cathode cylinder and having a diameter small enough so that there is formed between the inner and outer cathode cylinders a space to effectively disperse heat; the outer cathode cylinder being inserted in and fitted to a cylindrical cathode holder at first supporting points in the axial direction of the outer cathode cylinder, the cylindrical cathode holder being fitted to a supporting piece at second supporting points in the axial direction of the outer cathode cylinder which are separated from the first supporting points, respective portions of the outer cathode cylinder and cathode holder, at least between the first and second supporting points, being formed respectively of materials having substantially the same thermal expansion coefficient.

4,071,804

MAGNETRON DEVICE HAVING MAGNETIC MEANS FOR GENERATING A UNIFORM INTERACTION FIELD

Tokuju Koinuma, Kawasaki; Hideki Yamamiya, Yamato, and Norio Tashiro, Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

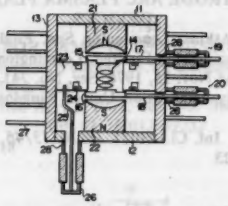
Continuation of Ser. No. 654,532, Feb. 2, 1976. This application Feb. 25, 1977, Ser. No. 772,142

Claims priority, application Japan, Jan. 31, 1975, 50-13227; Mar. 8, 1975, 50-28281

Int. Cl.[2] H01J *25/50*

U.S. Cl. 315—39.71 15 Claims

1. A magnetron device for generating a substantially uniform magnetic field which comprises a cathode electrode and an anode electrode disposed concentrically with said cathode electrode so as to jointly constitute a cylindrical electrode assembly; a plurality of vanes inwardly projected from the inner surface of said anode electrode; a resonance cavity circuit defined by a portion of said anode and vanes and for oscillating electric waves when supplied with the energy of electrons emitted from the cathode electrode; an output circuit for drawing out an oscillated output from said resonance cavity circuit; and a magnetizing device in which a pair of permanent magnets are disposed on the opposite sides of an interaction space formed between the cathode and anode, at least one



of the mutually facing magnetic pole surfaces of said permanent magnets being formed into a concave shape, thereby controlling the orbit through which electrons emitted from the cathode electrode revolve about the axis of said cathode electrode.

4,071,805

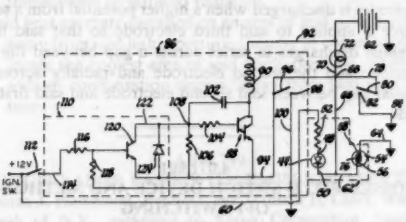
INTERIOR LIGHTING DELAY CIRCUIT

Eugene W. Brock, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 16, 1976, Ser. No. 723,764

Int. Cl.[2] B60Q *7/00*

U.S. Cl. 315—84 3 Claims



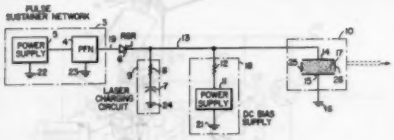
1. In a vehicle lamp control system for selectively energizing a vehicle interior lamp from a vehicle battery in response to operation of a door jamb switch selectively opened and closed in response to the door being positioned closed and open, respectively, the combination of: first circuit means including the door jamb switch for energizing the interior lamp when the door is opened, second circuit means including a relay switch for energizing the lamp independently of said door jamb switch, a relay switch control circuit for operating said relay switch closed when said door is momentarily opened for maintaining the interior lamp energized when the door is closed, timer circuit means including said relay switch for terminating energization of said lamp a predetermined delayed period after door closure, said relay switch control circuit including a coil and a series connected first transistor having its emitter and base connected to the vehicle battery source only when the vehicle door is closed to maintain the transistor nonconductive and being responsive to the door being opened to ground said emitter to cause the first transistor to be conductive from the collector to emitter terminals thereof, said timer circuit means being responsive to conduction of said first transistor and closure of said relay switch to remove battery potential from the base of said first transistor at a rate to maintain the relay switch conditioned for the predetermined delay period for maintenance of interior light energization following door closure, a vehicle ignition switch, means including a second transistor responsive to operation of the ignition switch to remove base potential from the first transistor when the ignition switch is turned on to immediately turn off the interior light before the vehicle is started and shifted to a drive mode.

4,071,806

SELF-TRIGGERING CIRCUIT FOR GAS-FILLED LASER

William F. List, Linthicum, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 2, 1976, Ser. No. 720,024
Int. Cl.[2] H01S 3/092
U.S. Cl. 315—150 4 Claims



1. A self-triggering apparatus and circuit for use in producing an output from a gas-filled laser comprising:

a. a gas-filled laser having a cavity including means for injecting an ionizing radiation pulse into said laser cavity for ionizing the gas therein;

b. bias circuit means for generating a low current discharge to initiate a glow discharge in said laser cavity in response to ionization of said gas;

c. pulse generating means for generating a laser sustaining discharge pulse voltage across said laser cavity; and

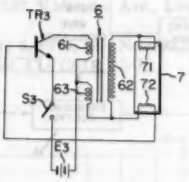
d. switching means, including an active semiconductor device, responsive to the ratio of the change in electrical parameters with respect to a change in time occurring in the laser in response to the initiation of said low current discharge by introduction of the ionizing radiation pulse, for electrically connecting said laser sustaining discharge pulse voltage to said laser cavity for transferring pulse energy from said pulse generating means to said glow discharge.

4,071,807

FLUORESCENT LAMP LIGHTING DEVICE

Yoshinobu Ichinose, No. 4-8, 5-chome, Soshigaya, Setagaya, Tokyo, Japan

Filed Oct. 18, 1976, Ser. No. 733,302
Claims priority, application Japan, Aug. 13, 1976, 51-96853
Int. Cl.[2] H05B 41/29; H03K 3/28
U.S. Cl. 315—219 2 Claims



1. Apparatus for energizing a fluorescent lamp having a pair of filaments, each having first and second ends, from a d.c. power source comprising

a transistor having first, second and third electrodes,

a transformer including a primary winding having one end connected to the first electrode of said transistor and the other coupled through said d.c. power source to the second electrode of said transistor, a first secondary winding having one end connected to the first and second ends of one of the filaments of said fluorescent lamp and the other end connected directly to the first end of the other filament of said fluorescent lamp, and a second secondary winding connected between the other ends of said primary and first secondary windings, and

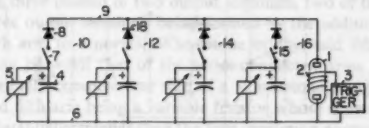
means coupling the second end of the other filament of said fluorescent lamp to the third electrode of said transistor.

4,071,808

METHOD AND CIRCUIT FOR OPERATING AN ELECTRICAL FLASH-TUBE

John Hobart Zentmyer, 124-F N. Brighton St., Burbank, Calif. 91506

Filed July 15, 1976, Ser. No. 705,731
Int. Cl.[2] H05B 41/32
U.S. Cl. 315—241 R 9 Claims



2. A flash-tube electrical circuit, comprising:

a. a triggerable electrical flash-tube (1 or 38),

b. plural separate capacitors (4,etc.,20,21,etc.) having comparable capacitances,

c. separate means to charge a capacitor (5,etc.,23,etc.), individually connected to each said separate capacitor, at least one of said means being variable, and

d. separate unidirectionally conductive means (8,etc.,22,25,etc.) individually connected to each said separate capacitor and collectively to said flash-tube,

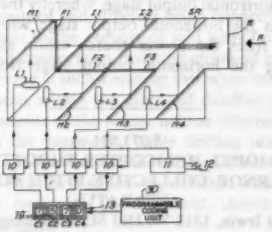
whereby, upon said flash-tube being triggered, each said separate capacitor is discharged through a said unidirectionally conductive means and through said flash-tube.

4,071,809

APPARATUS FOR SYNTHESIZING OF COLORS

Jean Michel Weiss, 50, rue Sebastien Mercier, 75015 Paris, France, and Pierre-Regis Marie Irissou, 2, rue Albert de Mun, Meudon, France (92190)

Filed Nov. 13, 1975, Ser. No. 631,457
Claims priority, application France, Nov. 18, 1974, 74 37977
Int. Cl.[2] H05B 41/34, 41/44
U.S. Cl. 315—312 11 Claims



1. A colour synthesizer comprising:

a discharge lamp source;

a plurality of colour filters;

means mounting said filters relative to said source to produce radiation in each of a predetermined number of primary colours along a common path, said mounting means comprising:

a movable support carrying said plurality of colour filters;

means rotating said support to pass said colour filters in succession in front of said lamp;

a trigger circuit for said lamp; and

a synchronization circuit responsive to the rotation of said support connected to said trigger circuit to control the discharge of said lamp; and

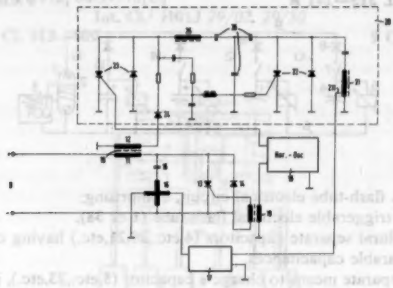
means for varying the luminous intensity of said source thereby varying the luminous intensity of the primary colour radiation from said filters.

4,071,810

SUPPLY CIRCUIT FOR A TELEVISION RECEIVER

Gerd Dobbert, Deizisau, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed June 2, 1976, Ser. No. 692,064
Int. Cl.[2] H01J *29/70, 29/76*
U.S. Cl. 315—400 **7 Claims**



1. A supply circuit for a television receiver having a horizontal output stage including means for controlling line sweep and commutation, the energy required by said horizontal output stage being provided by a power source through a controllable supply circuit that isolates the power source from the horizontal output stage, said controllable supply circuit comprising:

an input transformer having a secondary winding connected to the horizontal output stage for providing the energy required thereby and a primary winding adapted for connection to the power source and being electrically isolated from the secondary winding and the horizontal output stage;

electronic switch means connected in series with the primary winding of the transformer;

first switching control means for switching on the electronic switch means as a function of line frequency; and

second switching control means for switching off the electronic switch means as a function of the energy required by the horizontal output stage, whereby the supply circuit provides the horizontal output stage with the required energy from the power source while also electrically isolating the horizontal output stage from the power source.

4,071,811

MODEL HELICOPTER THROTTLE GOVERNOR/COLLECTIVE PITCH CONTROL APPARATUS

Arlyle Floyd Irwin, 1312 W. Hill St., Champaign, Ill. 61820

Filed Mar. 1, 1976, Ser. No. 662,694
Int. Cl.[2] H04Q *7/02;* **B61B** *13/08*
U.S. Cl. 318—16 **8 Claims**

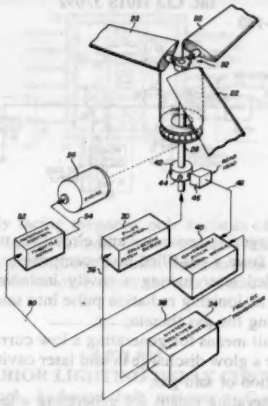
1. A throttle governor control apparatus for radio controlled model helicopters having an engine throttle servo for varying the rotational speed of the helicopter rotor and a collective pitch of said rotor, said apparatus comprising:

sensing means for periodically sensing changes in the model helicopter rotor speed in response to a first variation in collective pitch, including means for generating a timing signal corresponding to the sensed rotor speed;

reference means responsive to said timing signal for providing a reference signal representing a first sensed rotor speed;

comparison means coupled to said sensing means and said reference means for comparing said reference signal representing said first sensed rotor speed with said timing signal for a subsequently sensed rotor speed, including means for generating an error signal proportional to changes between said first and substantially sensed rotor speeds;

control signal means connected to said comparison means and responsive to said error signal for generating a control signal proportional to said error signal; and



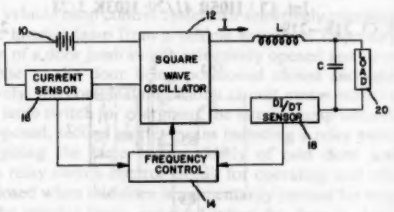
means for coupling said control signal to said throttle servo for proportionately varying said rotor speed in response to said first variation for maintaining said rotor speed substantially constant in response to variations in collective pitch.

4,071,812

AC INVERTER WITH CONSTANT POWER OUTPUT

Loren H. Walker, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 1, 1976, Ser. No. 662,653
Int. Cl.[2] H02M *7/00*
U.S. Cl. 363—80 **29 Claims**



1. A constant power electrical source comprising in combination:

power supply means connected to furnish a variable frequency electric power output at substantially constant voltage;

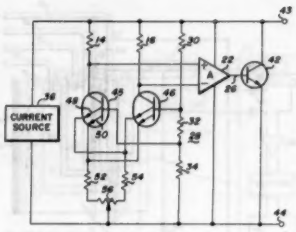
an output circuit including a first capacitor and an inductor connected in series with said power output to form a resonant circuit and a load impedance connected in parallel with said first capacitor; and

means which function to automatically adjust the frequency of said power supply means, in reponse to changes of the value of said load impedance, to an operating frequency, near but not at the resonant frequency of said output circuit, whereat the voltage transfer function of said output circuit is substantially equal to a constant multiplied by the square root of the equivalent shunt resistance of said output circuit.

4,071,813
TEMPERATURE SENSOR

Robert C. Dobkin, Atherton, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Sept. 23, 1974, Ser. No. 508,462
Int. Cl.[2] G01K 7/00
U.S. Cl. 323—8 8 Claims



8. A two-terminal temperature sensor, comprising

a pair of terminals,

a current source connected between said pair of terminals,

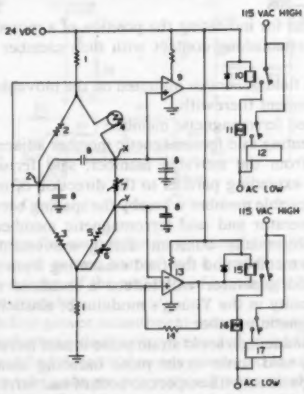
means connected between said terminals for sensing temperature and providing an output proportional to temperature, said means including a pair of transistors and a pair of resistors each connected in series with a respective one of said pair of transistors across said terminals, a differential amplifier having a pair of inputs each connected to the collector-emitter circuit of a respective one of said pair of transistors and providing said output proportional to temperature, a voltage divider connected across said terminals and having a pair of outputs each connected to the base of a respective one of said pair of transistors, and a current source connected to a collector-emitter

a third transistor having its collector and emitter connected to a respective one of said terminals and its base connected to the output of said sensing means, such that the voltage between said terminals is directly proportional to temperature.

4,071,814
DUAL-OUTPUT BRIDGE FOR BIDIRECTIONAL CONTROL

William Baker Voss, 387 N. Kenter Ave., Los Angeles, Calif. 90049

Filed July 6, 1976, Ser. No. 697,341
Int. Cl.[2] G01R 17/10
U.S. Cl. 323—75 B 5 Claims



1. A method of controlling two oppositely directed, on/off-type effectors (which are electrically powered controlling agents) by a five-arm bridge with two output signals, plus means for converting these signals into switched power for driving the effectors, one signal per effector, said method comprising in detail:

1. a D.C. bridge which has two input terminals, as for a Wheatstone bridge, and means to power same, but which has three instead of two output terminals, two of the said three output terminals being formed by the addition of a fifth arm to a normal Wheatstone bridge, said fifth arm lying between two of the series-connected arms which normally compose one side of a Wheatstone bridge, and said fifth arm being a variable resistor whose resistance is substantially smaller than the four remaining normal arms of the bridge, the two output terminals being thus formed by the said fifth arm generating two separate output signals, the return path for both signals being the third of the said three output terminals and lying on the side of the bridge opposite to the fifth arm, the voltages of the two signals differing slightly from each other but both varying together in response to a resistive sensor which composes one of the four normal arms of the bridge, the resistance of said sensor varying negatively (inversely) with the controllable parameter which it senses, the said two output signals of the bridge defining a deadband (passband), each boundary of which corresponds to a zero voltage of one of the said two signals;
2. two means for detecting zero-crossings of D. C. voltages and switching between dual output states in response, the inputs of said means being connected to said two output signals of the bridge on a one-to-one basis;
3. two means in cascade for amplifying the said dual output states, such amplifications being adequate for actuating appropriate effectors;
4. two oppositely directed on/off type effectors, one of which, when electrically actuated, operates at full power on the aforesaid parameter to decrease that parameter, and the other of which, when electrically actuated, operates at full power on the same parameter to increase that parameter, either resultant change in the said parameter affecting, in turn, the response of the aforesaid sensor to the parameter, the inputs of said effectors being connected on a one-for-one basis to the outputs of said amplifying means in cascade, all connections from the aforesaid bridge to the effectors being in such a manner that when the said parameters remains within the aforesaid deadband defined by the two outputs of the bridge neither effector is actuated but when the parameter, while drifting under external influence, crosses either aforesaid boundary of the deadband, that effector is selectively actuated which drives the parameter back into the deadband, thereby becoming deactuated again.

4,071,815
WELL LOGGING SYSTEM FOR MEASURING REMANENT MAGNETIC FIELDS IN THE EARTH

Joseph Zemanek, Jr., Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sept. 20, 1976, Ser. No. 724,431
Int. Cl.[2] G01V 3/18, 3/10, 3/00
U.S. Cl. 324—8 9 Claims

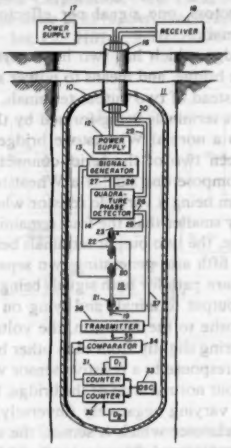
1. A method for determining paleomagnetic reversals between subsurface formations traversed by a borehole, comprising the steps of:

a. measuring the differential in the earth's total magnetic field at two spaced-apart positions within the borehole,

b. measuring the differential in the earth's magnetic susceptibility at each of said two spaced-apart positions within the borehole,

c. subtracting said differentials to provide a measurement of

the change in remanent magnetism between adjacent subsurface formations, and



d. recording said change in remanent magnetism in correlation with depth to provide a record of the location of paleomagnetic reversals between subsurface formations.

4,071,816

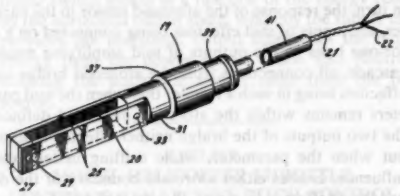
MONITORING SUSPENSION STABILITY

Eugene P. Weisser, Verona, Pa.; G. Alan Osan, Marlton, N.J., and Edward P. Mailki, Lower Burrell, Pa., assignors to ARCO Polymers, Inc., Philadelphia, Pa.

Division of Ser. No. 630,484, Nov. 10, 1975, Pat. No. 4,007,319. This application Sept. 24, 1976, Ser. No. 726,372

Int. Cl.² G01N *27/42*

U.S. Cl. 324—30 B **1 Claim**



1. A electrical conductivity cell consisting of a first and second stainless steel electrode each having a highly polished flat, rectangular surface and said electrodes being rigidly spaced apart with said rectangular surfaces parallel to each other to form an interelectrode space through which a liquid to be measured containing soft and sticky polymer droplets may pass freely, without allowing polymer to build up on the surfaces of the electrodes, said spacing being kept rigidly uniform by a first non-electrically conducting spacer at the bottom of the electrodes and a second non-electrically conducting spacer at the top of the electrodes, said top spacer being fastened to a pipe coupling and through a reducing bushing to an exit pipe which is long enough to exit any reactor in which the cell is used while the cell plates are immersed into the liquid to be measured; each of said electrodes being connected inside the pipe coupling to an insulated wire; siad wires being carried outside of the reactor inside the exit pipe; and said connections and said pipe coupling being completely embedded by an epoxy resin capable of withstanding temperatures of at least 150° C at up to 150 psig pressure; said cell having no cell housing around the electrodes.

4,071,817

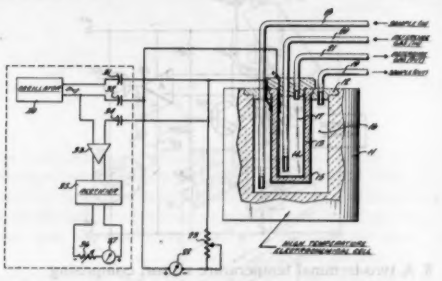
HIGH TEMPERATURE ELECTROCHEMICAL CELL TESTER

George R. Bahl, Springfield, Pa., assignor to Suntech, Inc., St. Davids, Pa.

Filed Mar. 8, 1976, Ser. No. 664,733

Int. Cl.² G01N *27/42*

U.S. Cl. 324—30 R **12 Claims**



1. In an electrochemical cell system having an electrolyte completely separating two chambers with an electrode located on each side of the electrolyte, and which indicates a relationship between the contents of one chamber and the contents of the other chamber by the potential difference created across the two electrodes when the cell is heated to a predetermined high temperature, and has a direct current measuring system for indicating this potential difference, an improvement for detecting the resistance of the combination of the electrodes and electrolyte without removing the electrodes and electrolyte from the electrochemical cell and without interfering with the continuous operation of the cell, said improvement comprising:

a. means for impressing an alternating current input signal across the electrodes; and

b. means, responsive to an output alternating current signal from the electrodes, for determining the magnitude of a parameter of the output alternating current, this magnitude being related to the resistance between the two electrodes, said resistance value indicating the quality of the electrodes and electrolyte.

4,071,818

MAGNETOSTRICTIVE POSITION INDICATOR

Raymond J. Krisst, West Hartford, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Nov. 3, 1975, Ser. No. 628,043

Int. Cl.² G01R *33/00*

U.S. Cl. 324—208 **15 Claims**

1. Apparatus for indicating the position of a movable member without establishing contact with such member comprising:

a magnetic field generator mounted on the movable member for movement therewith;

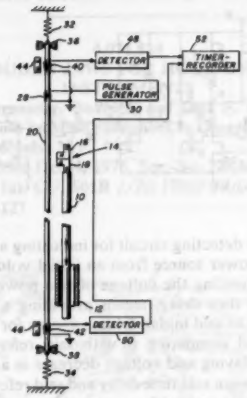
an elongated ferromagnetic member;

means mounting said ferromagnetic member adjacent to and spaced from the movable member, said ferromagnetic member extending parallel to the direction of movement of the movable member whereby the spacing between said field generator and said ferromagnetic member will remain substantially constant during movements of the movable member and the field emanating from said magnetic field generator will induce a localized region of discontinuity in the Young's modulus of elasticity of said ferromagnetic member;

means for inducing a sonic strain pulse in said ferromagnetic member, said sonic strain pulse inducing means being fixed in position with respect to both of said ferromagnetic and movable members, sonic strain pulses from said inducing means traveling along said ferromagnetic member and

being at least partly reflected from said region of Young's modulus discontinuity;

first sonic strain pulse detector means fixedly mounted along said ferromagnetic member in proximity to said inducing means, said first detector means providing an output signal commensurate with the arrival at said first detector means of a sonic strain pulse reflected from the region of Young's modulus discontinuity in said ferromagnetic member; and

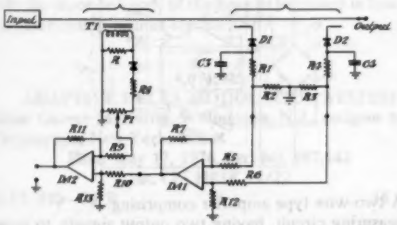


means connected to said first detector means and responsive to signals provided thereby for providing an output signal commensurate with the time required for a sonic strain pulse to travel along said ferromagnetic member from said sonic pulse inducing means to said region of Young's modulus discontinuity and for a reflected pulse to travel to said first detector means, said time being an indication of the position along said ferromagnetic member of said magnetic field generator.

4,071,819
DEVICE FOR SENSING THE REAL PART IN A COMPLEX IMPEDANCE

Charles M. De Santis, Neptune, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 1, 1976, Ser. No. 737,830
Int. Cl.² G01R 27/04
U.S. Cl. 324—58 B **7 Claims**



1. A device for connection in a transmission line between a high frequency power source and a load for measuring the quantitative value of the real part of a complex impedance of the load comprising:

through-line power measurment means comprising forward and reflected power sensors coupled to said transmission line and first dectector means connected to said sensors to derive two voltages proportional respectively to the forward and reflected power;

a first comparison means connected to said first detector means with said two voltages as inputs, and having an output representing the difference between the forward and reflected power;

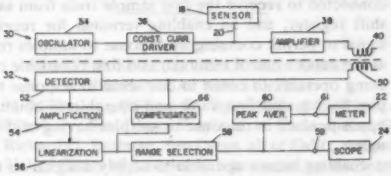
separate through-line current sensing means including a standard resistor connected so that radio-frequency current proportional to the line current flows through it, second detector means connected thereto to derive a voltage proportional to the power dissipated in the standard resistor;

a second comparison means having one input from the second detector means and another input from the output of said first comparison means, so that when its output is a null the real part of the load impedance is equal to a predetermined value depending on the value of said stanard resistor.

4,071,820
MEASUREMENT SYSTEM

Albert J. Mushinsky, Framingham, Mass., assignor to Alton Corporation, Framingham, Mass.

Filed Apr. 5, 1976, Ser. No. 673,742
Int. Cl.² G01R 27/26
U.S. Cl. 324—61 R **15 Claims**

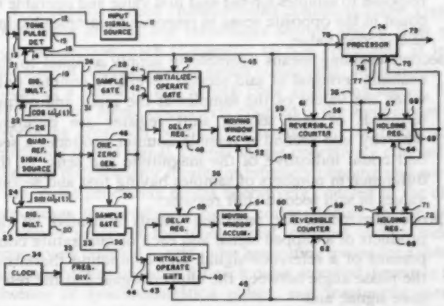


4. The system as claimed in claim 3 wherein said linearization stage includes a DC amplifier that has an input network and a feedback network, said input network including a plurality of resistance elements and a plurality of diodes connected in parallel with corresponding resistance elements and for switching resistance elements out of the input network as a function of the magnitude of said non-linear electrical signal output.

4,071,821
QUADRATURE CORRELATION PHASE DETERMINING APPARATUS

William P. Harthill, and James L. Roberts, both of Seattle, Wash., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 28, 1976, Ser. No. 681,103
Int. Cl.² G01R 25/00
U.S. Cl. 324—83 R **14 Claims**



1. Phase determining apparatus for measuring the phase of a tone signal of known tone frequency relative to a reference signal of the same frequency, comprising in combination:

input means for supplying the tone signal;

clipping means for hard limiting the tone signal to produce a clipped signal having either of two instantaneous amplitudes;

a reference signal source for generating first and second square wave signals comprising quadrature components of a reference signal having a repetition rate equal to said tone frequency and either of two instantaneous amplitudes substantially equal to those of the clipped signal;

first and second digital multipliers for multiplying the clipped signal and each of the first and second square wave signals to produce first and second product signals respectively, each having a first value when the instantaneous amplitudes of its multiplicand signals are substantially equal and a second value when the instantaneous amplitudes of its multiplicand signals are different;

sampling means for sampling the first and second product signals at a predetermined sampling rate to provide first and second sample trains respectively;

a first shift register having an input terminal connected to receive the first sample train, an output terminal for subsequently supplying a first sample train, and a predetermined number of storage locations through which samples are shifted seriatim at said sampling rate between the input and output terminals;

a first reversible counter having a count control terminal connected to receive the first sample train from said first shift register, and an enabling terminal for receiving a signal to permit counting in response to samples received at the count control terminal, said first reversible counter being operable to count in one sense in response to samples having said first value and operable to count in the opposite sense in response to samples having said second value;

first enabling means operable to supply a signal to the enabling terminal of said first reversible counter only when the values of the samples at the input and output terminals of said first shift register are different, whereby said first reversible counter produces a first count indicative of the magnitude and sense of the difference in numbers of samples having first and second values in said first shift register;

a second shift register having an input terminal connected to receive the second sample train, an output terminal for subsequently supplying the second sample train, and a predetermined number of storage locations through which samples are shifted seriatim at said sampling rate between the input and output terminals;

a second reversible counter having a count control terminal connected to receive the second sample train from said second shift register, and an enabling terminal for receiving a signal to permit counting in response to samples received at the count control terminal, said second reversible counter means being operable to count in one sense in response to samples having said first value and operable to count in the opposite sense in response to samples having said second value;

second enabling means operable to supply a signal to the enabling terminal of said second reversible counter only when the values of the samples at the input and output terminals of said second shift register are different, whereby said second reversible counter produces a second count indicative of the magnitude and sense of the difference in numbers of samples having first and second values in said second shift register;

processing means for receiving counts indicative of the products of a clipped signal and each of quadrature components of a reference signal, and computing therefrom the phase angle between the clipped signal and the reference signal; and

transfer means for transferring the first and second counts from said reversible counters to said computing means, whereby said computing means is operable to compute the phase angle of the tone signal relative to the reference signal.

4,071,822

DIGITAL VOLTAGE DETECTING CIRCUIT FOR A POWER SOURCE

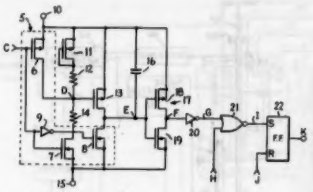
Masaaki Kamiya, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Sept. 16, 1976, Ser. No. 723,947

Claims priority, application Japan, Sept. 16, 1975, 50-111823

Int. Cl.[2] G01R *19/00, 19/26*

U.S. Cl. 324—111 **6 Claims**



1. A voltage detecting circuit for indicating a decrease in the voltage of a power source from an initial voltage comprising means for converting the voltage of said power source into a corresponding time delay, means providing a reference time corresponding to said initial voltage, means for measuring said time delay and comparing it with said reference time and means for displaying said voltage decrease as a function of the difference between said time delay and said reference time, said converting means comprising a capacitor, means for connecting said capacitor to said power source to be charged thereby, means for discharging said capacitor at a rate dependent on the voltage of said power source, and means for detecting the discharge of said capacitor to a predetermined level, said delay time being the discharge time of said capacitor to said predetermined level after initiation of discharge by said discharging means.

4,071,823

TWO-WIRE TYPE AMPLIFIER

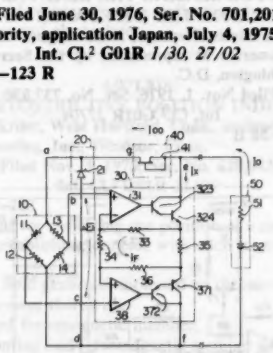
Tsutomu Okayama, Katsuta, Japan, assignor to Hitachi, Ltd., Japan

Filed June 30, 1976, Ser. No. 701,201

Claims priority, application Japan, July 4, 1975, 50-81800

Int. Cl.[2] G01R *1/30, 27/02*

U.S. Cl. 324—123 R **5 Claims**



1. A two-wire type amplifier comprising:

a measuring circuit, having two output signals, to measure quantities to be measured;

first and second differential amplifiers, each having first and second input terminals;

one of the output signals derived from said measuring circuit being coupled to the first input terminal of said first differential amplifier, with the other output signal being coupled to the first input terminal of said second differential amplifier;

first and second current control means being connected in series and controlled by said first and second differential amplifiers, respectively and

wherein said first and second current control means are connected in series via a common resistor and further comprising feedback means for feeding back the voltage across said common resistor to the respective second input terminals of said first and second differential amplifiers;

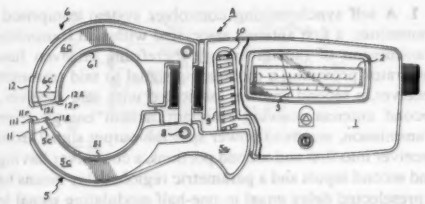
receiving means including a receiving resistor and a power source connected in series with said series-connected first and second current control means; and

said first and second current control means controlling said power source current.

4,071,824
SHROUDED JAWS FOR HOOK-ON TYPE INSTRUMENTS

Warren N. Kernander, Boxford, and Carl F. Van Bennekom, Lynnfield, both of Mass., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 4, 1976, Ser. No. 729,588
Int. Cl.[2] G01R *1/20*; H01F *17/06*
U.S. Cl. 324—127 **5 Claims**

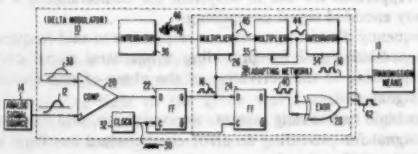


1. A pair of relatively movable, shrouded jaws operably mountable on a hook-on type measuring instrument, said jaws being formed to define a closed magnetically conductive loop for encircling an electrical conductor, mounting means for mounting the jaws in relatively movable relationship on an instrument housing to enable the jaws to be moved from an open, conductor-receiving position to a closed, conductor-encircling position, each of said jaws being substantially completely covered with insulating material except for a shrouded portion at the open end of each jaw, a first insulated, conductor shrouding means extending beyond the end of one of said jaws defining a first cup-shaped recess within which the uninsulated, shrouded portion of said one of said jaws is disposed, and a second insulated, conductor shrouding means extending beyond the end of the other jaw defining a second cup-shaped recess within which the uninsulated, shrouded portion of said other jaw is disposed, said first and second shrouding means being formed to cooperate in nesting relationship thereby to enable the shrouded ends of the jaws to be closed in low reluctance relationship against one another.

4,071,825
ADAPTIVE DELTA MODULATION SYSTEM

William George McGuffin, Willingboro, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 17, 1976, Ser. No. 687,143
Int. Cl.[2] H03K *13/22*
U.S. Cl. 325—38 B **16 Claims**



1. In a system of the type including a modulator and demodulator for communicating an analog input signal as a sequence of digital bits, the modulator comprising first means for generating a signal indicative of the difference between said analog input signal and a feedback signal: second means, responsive to said signal from said first means for generating a digital output signal at a predetermined bit rate, said digital output signal being indicative of the polarity of the signal from said first means during the time of occurrence of respective digital bits, said digital output signal being communicated to said demodulator: third means, responsive to said digital output signal, for generating an amplitude varied output signal indicative of said digital output signal, but having amplitude levels in accordance with a time derivative of said analog input signal: fourth means, responsive to said amplitude varied signal, for generating an analog signal indicative of said amplitude varied signal, said signal from said fourth means being applied as said feedback signal to said first means;

the improvement wherein said third means comprises:

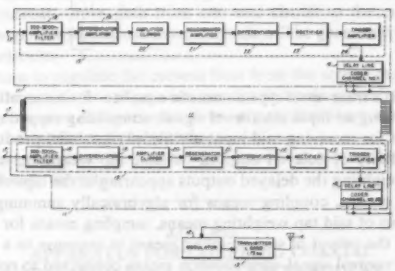
fifth means, responsive to said digital output signal, for generating a signal indicative of the absolute value of the derivative of said analog input signal; and

sixth means, responsive to the output of said fifth means and said digital signal, for generating a signal having an amplitude representative of the product of said digital output signal and the signal from said fifth means, said signal from said sixth means being applied to said fourth means.

4,071,826
CLIPPED SPEECH CHANNEL CODED COMMUNICATION SYSTEM

Ralph H. Miller, Jr.; William W. Dyer, both of La Mesa; John A. Waterbury, San Diego; Wayland A. Carlson, San Diego, and Richard O. Eastman, San Diego, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 27, 1961, Ser. No. 106,413
Int. Cl.[2] H04B *1/00*
U.S. Cl. 325—39 **10 Claims**



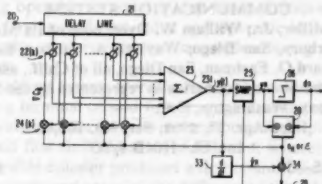
1. A clipped speech channel coded communications system comprising at least one transmitter section and at least one receiver section; each transmitter section containing at least one speech code generating means comprising; input means for coupling a signal to said speech code generating means, first differentiator means operatively coupled to the input means for producing crossover points corresponding to the frequencies contained in said signal, clipper means operatively coupled to said first differentiator means for infinitely clipping said waveform, pulse generating means operatively coupled to the clipper means for producing pulses corresponding to the zero crossover points of the input signal, channel coding means operatively coupled to said pulse generating means for producing coded trains of pulses for each pulse received therein in the absence of synchroninzation pulses; and transmitter means operatively coupled to the outputs of said speech code generators for radiating said coded trains of pulses; and receiver section comprising; input means for receiving and detecting trains of pulses; channel decoder means operatively coupled to said input means comprising, delay means for retaining said

trains of pulses, a number of channel coincidence circuits corresponding to the number of channels operatively coupled to said delay means, each said coincidence circuit producing an output pulse therefrom when an appropriately coded train of pulses is coincident therein; and intelligence restoring means operatively coupled to each of said coincidence circuit means for producing a signal corresponding substantially to said original input signal.

4,071,827
TRANSVERSAL TYPE AUTOMATIC PHASE AND AMPLITUDE EQUALIZER

Shin'ichi Koike; Seijiro Hayashi, and Michio Takayama, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Dec. 9, 1976, Ser. No. 749,136
Claims priority, application Japan, Dec. 9, 1975, 50-147154
Int. Cl.² H04B *1/12*
U.S. Cl. 325—42 **6 Claims**



1. In a transversal type automatic equalizer for automatically equalizing an input multilevel signal, comprising tapped delay means for receiving said input multilevel signal and producing a plurality of delayed outputs, variable tap weighting means for weighting the delayed outputs appearing at the taps of said delay means, coupling means for algebraically summing the outputs of said tap weighting means, sampling means for sampling the output of said coupling means in response to a sampling control signal, identification means connected to receive the output of said sampling means for providing an identified signal as the output of said automatic equalizer, error means for comparing the input and output signals of said identification means to provide an error signal representative of the difference between said input and output signals, and first multiplication means for multiplying said delayed outputs by said error signal in order to provide said tap control signals to said variable tap weighting means; the improvement wherein said transversal type automatic equalizer further comprises:

differentiating means for differentiating the output of said coupling means;

second multiplication means for receiving said error signal and the output of said differentiating means, said multiplication means having an output signal corresponding to the product of said received signals;

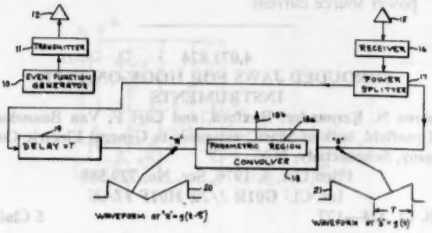
integrating means for integrating the output of said second multiplication means; and

control means for providing said sampling control signal to said sampling means in response to the output of said integrating means.

4,071,828
SELF SYNCHRONIZING CONVOLVER SYSTEM

Morton Setrin, Rome, N.Y., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 18, 1976, Ser. No. 687,581
Int. Cl.² H04B *15/00*
U.S. Cl. 325—65 **1 Claim**

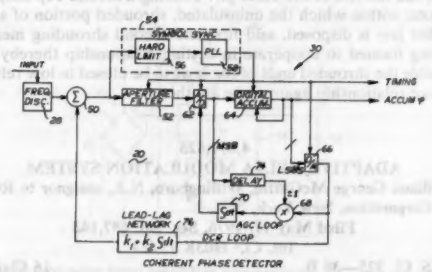


1. A self synchronizing convolver system comprised of a transmitter, a first antenna associated with said transmitter for transmission of radiant energy therefrom, an even function generator providing a modulating signal to said transmitter, a receiver, a second antenna assoicated with said receiver, said second antenna rceiving resultant radiant energy from the transmission, means to power split the output signal from said receiver into first and second portions, a convolver having first and second inputs and a parametric region, delay means having a preselected delay equal to one-half modulating signal length T, said first portion passing through said delay means to said first input of said convolver and said second portion being fed directly to said second input of said convolver, with the output signal being provided by way of said parametric region.

4,071,829
COHERENT PHASE DETECTOR USING A FREQUENCY DISCRIMINATOR

Robert Curtis Davis, Melbourne Beach, and Daniel Dix McRae, W. Melbourne, both of Fla., assignors to Harris Corporation, Cleveland, Ohio

Filed Nov. 9, 1976, Ser. No. 740,365
Int. Cl.² H03D *3/02*; H04L *27/14*
U.S. Cl. 329—122 **7 Claims**



1. Apparatus for use in a system for demodulating a frequency encoded signal comprising:

frequency discriminator means responsive to said frequency encoded signal for providing a baseband signal corresponding to the derivative of the phase of said encoded signal; and,

baseband processing means responsive to said baseband signal for providing an error compensated baseband signal, said baseband processing means comprising

means for providing a timing signal related to the timing of said frequency encoded signal,

means for integrating said baseband signal over a discrete timing interval to provide a phase shift signal representing the amount by which the phase of said frequency encoded signal has shifted over said interval,

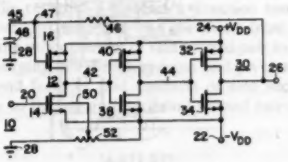
means for quantizing said phase shift signal into integral and fractional parts, and

means responsive to said fractional part of said quantized phase shift signal for providing error compensation for said baseband signal whereby said baseband processing means provides an error compensated baseband signal to the remainder of said system for demodulating said frequency encoded signal.

4,071,830
COMPLEMENTARY FIELD EFFECT TRANSISTOR LINEAR AMPLIFIER

Robert Charles Huntington, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed July 3, 1975, Ser. No. 593,073
Int. Cl.² H03F *3/16*
U.S. Cl. 330—277 **7 Claims**

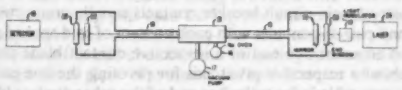


1. A complementary field effect transistor amplifier including an output circuit and an input circuit having a field effect transistor load device and a field effect transistor input device coupled in series comprising feedback circuit means coupled between said output stage and a gate electrode of said field effect transistor load device for biasing said field effect transistor load device to cause a controlled output voltage to be produced by said output circuit, wherein said feedback circuit means includes a low pass filter which acts to feedback an output signal produced at an output of said output stage to said field effect transistor load device for preventing incremental excursions of said output signal from substantially affecting the current produced by said field effect transistor load device.

4,071,831
AMPLIFYING CHARACTERISTICS OF A CAVITY-ENCLOSED NONLINEAR MEDIUM

Hyatt McDonald Gibbs, Warren; Samuel Leverte McCall, Jr., Gillette, and Thirumalai Nallan Chakravarthy Venkatesan, New Providence, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 563,122, March 28, 1975, Pat. No. 4,012,699. This application Aug. 3, 1976, Ser. No. 711,421
Int. Cl.² H01S *3/10*; G02F *1/28*
U.S. Cl. 330—4.3 **24 Claims**



1. A method of amplifying variations in an optical signal of a given wavelength comprising

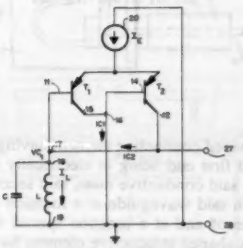
introducing light of the given wavelength into a cavity formed by at least two surfaces that reflect light of the given wavelength, and which surfaces are separated at least in part by a positive-temperature nonlinear medium fixing the cavity and medium characteristics such that the absorptive properties of the medium dominate its dispersive properties and such that there is a single valued relationship between the intensities of the incident and transmitted signals which exhibits gain, and

extracting the amplified signal from said cavity.

4,071,832
CURRENT CONTROLLED OSCILLATOR

Robert L. Cloke, Santa Clara, Calif., assignor to Sperry Rand Corporation, New York, N.Y.

Filed June 14, 1976, Ser. No. 695,828
Int. Cl.² H03B *5/12*
U.S. Cl. 331—117 R **2 Claims**



1. A transistor oscillator comprising, in combination:

first and second transistors;

a current source connected to supply current to each transistor emitter;

a first circuit including a short circuit conductor connected between the base of said first transistor and the collector of said second transistor;

a second circuit including a short circuit conductor connected between the base of said second transistor and the collector of said first transistor;

a resonance circuit connecting said first and second circuits;

a current return path from one said circuit to the current supply whereby oscillatory signals will be generated in the circuits;

means to regulate the current flow from the source through the transistors to provide current at levels exceeding the saturation of the transistors to vary the frequency range of the oscillator signals; and

means to detect the frequency of oscillation across the resonance circuit.

4,071,833
APPARATUS FOR COUPLING COAXIAL TRANSMISSION LINE TO RECTANGULAR WAVEGUIDE

Harry J. Gould, Cupertino, Calif., assignor to Ford Motor Company, Dearborn, Mich.

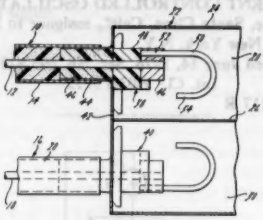
Filed Oct. 15, 1976, Ser. No. 732,688
Int. Cl.² H01P *5/08*
U.S. Cl. 333—33 **6 Claims**

1. In combination with a coaxial transmission line, having an outer conductor and a center conductor, and a rectangular waveguide, having a first axis parallel to the narrow sides of said waveguide and a second axis parallel to the wide sides of said waveguide, said first and second axes being mutually perpendicular and perpendicular to the direction of propagation of microwave energy through said waveguide, an improved apparatus for coupling microwave energy from said coaxial transmission line to said waveguide and vice versa, said improved apparatus comprising:

a. a cover on one end of said waveguide, said cover including a conductive material and having an opening for receiving said center conductor of said coaxial transmission line and having means for conductively connecting said

outer conductor of said coaxial transmission line to said conductive material of said cover;

b. a conductive mass positioned within said waveguide, said conductive mass being spaced from the walls of said waveguide and from said cover, said center conductor of said coaxial transmission line being in electrically conductive relation with said conductive mass; and



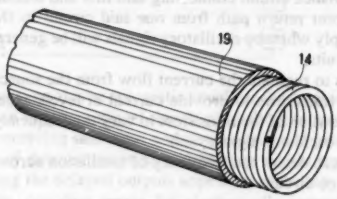
c. a hook-shaped conductive element having first and second ends, said first end being in electrically conductive relation with said conductive mass, said second end terminating within said waveguide at a location spaced from the walls thereof and at a location spaced from said cover, said hook-shaped conductive element having a curvature between its first and second ends that is in a plane that is parallel with said first axis of said waveguide.

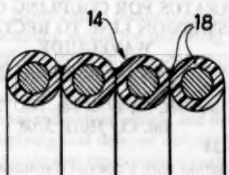
4,071,834

HELICAL WAVE GUIDE

Georges Comte, St. Leu la Foret, France, assignor to Les Cables de Lyon S.A., Lyon Cedex, France

Filed June 7, 1976, Ser. No. 693,928
Claims priority, application France, June 12, 1975, 75 18402
Int. Cl.² H01P *3/13*
U.S. Cl. 333—95 R **1 Claim**





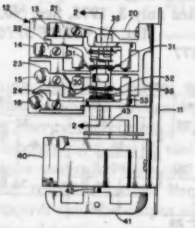
1. A helical wave-guide having a conductor wound in a helix, and an electrically conductive screen surrounding said conductor comprising: a wire coated with a thermoplastic insulator, adjacent turns of the helix being welded together by surface melting of the thermoplastic insulator, the insulation between adjacent turns degenerating predetermined modes and reducing electromagnetic transmission losses, said surface melting of the thermoplastic insulator providing mechanical bonding and electrical insulation, said thermoplastic insulator including a substantially thin layer of polar material of the grafted polyethylene type coated on the electrically conductive wire having a thermoplastic insulating coating selected from the group of polyolefines consisting of polyethylene, Teflon or polypropylene, said electrically conductive screen being formed by a metallic tube coated at its ends on its inside wall with a substantially thin layer of a heat sealing material for ensuring fixing of the helix inside the screen.

4,071,835

RELAY CONTACT CARRIER COATED WITH AN ANTISTATIC MATERIAL

Roland Russo, Chagrin Falls, and Richard Schneider, Mayfield Heights, both of Ohio, assignors to Clark Control, Inc., Cleveland, Ohio

Filed Mar. 26, 1976, Ser. No. 670,837
Int. Cl.² H01H *63/02*
U.S. Cl. 335—133 **5 Claims**



1. An electrical circuit making and breaking device including in combination

a supporting member;

a fixed contact mounted in said supporting member;

a movable contact;

a contact carrier of insulating material having the movable contact mounted thereon, said contact carrier being mounted in said supporting member for movement therein between a first position at which said contacts are open and a second position at which said contacts are closed;

an operating mechanism coupled to said contact carrier for moving said contact carrier within said supporting member between said first and second positions to selectively open and close said contacts; and

a coating of an antistatic material on the surface of said contact carrier whereby a charge of static electricity does not build up on the contact carrier or the movable contact.

4,071,836

CURRENT LIMITING CIRCUIT BREAKER

James W. Cook; Joseph M. Khalid, and Clark L. Oster, all of Cedar Rapids, Iowa, assignors to Square D Company, Park Ridge, Ill.

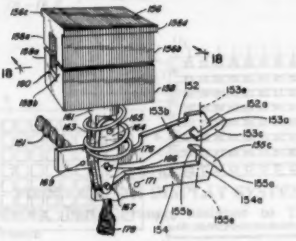
Filed Sept. 7, 1976, Ser. No. 721,012
Int. Cl.² H01H *77/10*
U.S. Cl. 335—195 **3 Claims**

1. For use in a circuit breaker of the type including means responsive to a fault current of one magnitude for separating a first pair of main circuit breaker contacts serially connected to a second pair of contacts with each contact of said second pair carried adjacent one end of a respective contact blade pivotable about a respective pivot axis for pivoting the one end of each contact blade from the one end of the other contact blade to separate said second pair of contacts and create an arc between said second pair of contacts movable from said pivot axis in response to a fault current of greater magnitude than said one magnitude, the improvement comprising:

a first face on each contact of said second pair extending past the opposite side margins of the respective contact blade and spaced intermediate the one end of the respective contact blade and the respective blade pivot axis for en-

gagement with the first face of the other contact of the second pair to extend a circuit through each blade from said first pair of contacts,

and a second planar face on each contact spaced a greater distance from the respective pivot axis than said first face and extending past the opposite side margins and the one



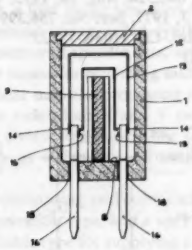
end of the respective blade in a direction transverse to a respective first face and in a direction from the second face on the other contact of said second pair to form an arc path diverging in a direction from said pivot axis between the second faces of said contacts of said second pair in response to the separation of said second pair of contacts.

4,071,837

FUSE CARTRIDGE

Pierluigi Ranzanigo, Brescia, Italy, assignor to Bassani Ticino S.p.A., Milan, Italy

Continuation of Ser. No. 596,082, July 15, 1975, abandoned.
This application Dec. 6, 1976, Ser. No. 747,538
Claims priority, application Italy, July 26, 1974, 25598/74
Int. Cl.² H01H *85/16*
U.S. Cl. 337—268 **4 Claims**



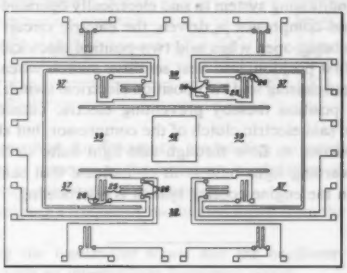
1. Fuse cartridge, comprising a hollow casing of insulated material having an internal chamber filled with quartz sand and being of a parallelpiped form having two transverse walls and two pairs of longitudinal walls normal to said transverse walls, a first of said transverse walls being integral with and a second of said transverse walls being removable from said casing, and one of said transverse wall being provided with holes; electrically conducting pins each having one end extending through a respective one of said holes into said chamber; a partition wall located in said chamber and extending substantially along a longitudinal plane of symmetry of said first pair of said longitudinal walls; and at least two flat fuse strips located in said chamber and each having two opposite ends each electrically connected to said one end of a respective one of said pins, said fuse strips being U-shaped and each further having two portions substantially parallel to said second pair of said longitudinal walls and connected to each other by means of a third portion extending adjacent to said second transverse wall and substantially parallel thereto, said fuse strips being located substantially parallel to one another so that one of said fuse strips is inwardly spaced from and outwardly embraced by the other fuse strip, each of said two portions of said one of said fuse strips being spaced from said partition wall, and each of said two portions of said other fuse strip being spaced from each of said second pair of said longitudinal walls at a constant distance.

4,071,838

SOLID STATE FORCE TRANSDUCER AND METHOD OF MAKING SAME

Barry Block, Los Altos Hills, Calif., assignor to Diax Corporation, Los Altos Hills, Calif.

Filed Feb. 9, 1976, Ser. No. 656,632
Int. Cl.² H01L *10/10*
U.S. Cl. 338—47 **37 Claims**



1. In a method for fabricating a solid state force transducer of the type including a leaf spring structure having a plurality of leg portions angularly separated about an axis of maximum compliance and supported so that said leg portions of the leaf spring structure are physically displaced relative to the support structure in response to the application of a force to said leaf spring structure, and including an output sensor means responsive to the displacement of at least one of said leg portions for deriving an output which is a function of the force applied to the transducer, the step of:

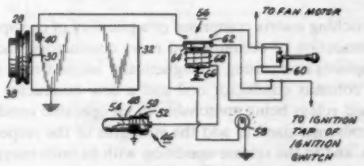
forming said leaf spring structure of a monocrystalline material.

4,071,839

MOTOR VEHICLE AIR CONDITIONER CONTROL AND WARNING SYSTEM

Jesse R. Hollins, 40 Stoner Ave., Great Neck, N.Y. 11021

Filed May 27, 1976, Ser. No. 690,679
Int. Cl.² F01P *5/14*
U.S. Cl. 340—53 **7 Claims**



1. A motor vehicle air conditioner control and warning system comprising a liquid cooled internal combustion engine, an ignition switch for turning on and shutting off said engine, said liquid cooled internal combustion engine including a cooling system in which a liquid medium is used to cool the internal combustion engine, a motor vehicle air conditioning system, said motor vehicle air conditioning system including a compressor, a manually operated control switch and an electrically operated clutch for driving said compressor, a two-position electrical switch, said electric clutch of the compressor being

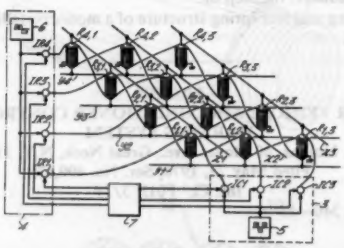
series connected to a first contact of said two-position switch, and a second contact of said two-position switch being connected in circuit to an electric warning light bulb, a thermal sensing means connected to said two-position electrical switch, said thermal sensing means being a heat sensitive switch having a housing, said housing being immersed in said liquid medium, said heat sensitive switch having two states, said heat sensitive switch being normally open in the first state when the temperature of said liquid medium is below a predetermined heat range and in the second state the heat sensitive switch is closed when the temperature of said liquid medium is above a predetermined heat range, said heat sensitive switch when in said first state causing said two-position electrical switch to be in a first position thereby allowing electric current to flow from a battery, through the "on" position of the "on" position of said ignition switch and said manually operated control switch of the air conditioning system to said electrically operated clutch, so that said compressor is driven, the electric circuit to said light bulb being open when said two-position electrical switch is in the first position, said heat sensitive switch when in said second state causing said two-position electrical switch to be in a second position thereby preventing electric current from flowing to said electric clutch of the compressor, but allowing electric current to flow through said light bulb, so that said electric warning light bulb is lit to indicate that said liquid medium in the engine cooling system is overheating.

4,071,840

SWITCHING DEVICE FOR REED RELAYS IN A MATRIX

Emanuel Marie Augustin Jammes, and Jean-Louis Marie Henri Bordier, both of Boulogne, France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Jan. 12, 1976, Ser. No. 648,433
Int. Cl.² H04Q 9/00
U.S. Cl. 340—166.5 **5 Claims**



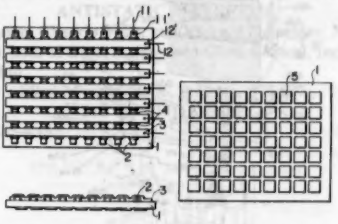
1. A switching matrix comprised of a plurality of crosspoints at the intersection of columns and rows conductors, each of said crosspoints comprising a magnetically latched reed relay having a columns conductor coil and a row conductor coil, each of said relays being switchable to an operated condition with its coils energized to add the strengths of the respective coil fields, and to the release condition with its coils energized subtractively and the coil of greater strength energized in a relay demagnetizing direction, a sequential pulse generator for each said columns conductor and a sequential pulse generator for each said rows conductor, means for selecting one of said columns generators and one of said rows generators to energize one or more coils of the selected relay at the intersection of the selected column and row, said generators operative through a relay release cycle of emitting pulses to energize the selected relay coils subtractively and for reversing the direction of the pulses of current flow in both coils to cause said coils to be energized subtractively once again.

4,071,841

DIELECTRIC MATRIX DEVICE

Akio Kumada, Kokubunji, Japan, assignor to Hitachi, Ltd., Japan

Filed Oct. 21, 1975, Ser. No. 624,338
Claims priority, application Japan, Oct. 21, 1974, 49-120387
Int. Cl.² G11C 11/22, 11/42
U.S. Cl. 365—65 **27 Claims**



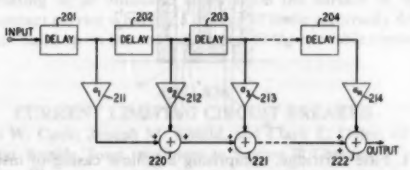
1. A dielectric matrix device comprising:
a. a dielectric material plate,
b. vertical and horizontal electrodes disposed on the same surface of said dielectric plate, said vertical and horizontal electrodes crossing each other at insulated portions thereof, and
c. a plurality of independent electrodes disposed on the opposite surface of said dielectric plate at portions which correspond to both the areas of crossing of the vertical and horizontal electrodes and areas adjacent to said areas of crossing.

4,071,842

APPARATUS FOR ANALOG TO DIGITAL CONVERSION

Stuart Keene Tewksbury, Middletown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 608,524, Aug. 28, 1975. This application Jan. 3, 1977, Ser. No. 756,399
Int. Cl.² H03K 13/22
U.S. Cl. 340—347 AD **3 Claims**



1. An error feedback pulse code modulation encoder for converting an analog input signal to a digital output signal representative thereof, comprising
a first differencing circuit for combining said input signal and an error feedback signal to generate a composite signal,
quantizing means responsive to said first differencing circuit fof generating said digital output signal by sampling said composite signal and converting said samples to digital form,
a second differencing circuit for combining said composite signal and said digital output signal to generate a quantizing error signal, and
means for generating said error feedback signal from said quantizing error signal including
1. a delay line having stages 1 through *n* for receiving said quantizing error signal, each of said stages having an output tap,

2. n attenuators having attenuation coefficients a_1 through a_n connected to respective ones of said output taps, and
3. means for algebraically summing the outputs of said attenuators to form said error feedback signal,

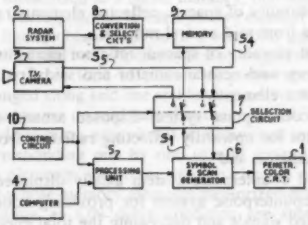
wherein said attenuation coefficients are selected in accordance with the relationship

$$a_i = \frac{(-1)^{i+1} n!}{(n-i)!\, i!}, \quad i = 1,2 \ldots n.$$

4,071,843
VIDEO COLOR DISPLAY SYSTEM

Jacques Marien, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Dec. 3, 1975, Ser. No. 637,148
Claims priority, application France, Dec. 27, 1974, 74 43149
Int. Cl.² G01S 7/06, 7/20, 7/22
U.S. Cl. 343—5 CD **6 Claims**



1. A video color display system for displaying on a color cathode-ray tube, a first image provided from raw video conjointly with a second image called synthetic image made of symbols representative of specific data, said system comprising

ancillary radar means for providing said raw video representative of a radar map and processing means for converting the said raw video into X and Y radar video numerical signals with a view to a line-by-line scan and for selecting these signals as a function of predetermined selection parameters;

display means comprising said color cathode-ray tube which is of the penetration type, and a very high voltage supply of the switchable type for supplying a very high voltage to said tube;

memory means for storing separately said selected video signals and comprising k layers each having a capacity of $n_1 \times n_2$ bits to produce a radar image constituting said first image having n_1 lines with n_2 dots per line in the course of a frame scan and to code the said radar signals on k bits for each dot, the said processing means providing at most 2^k separate allotments as a function of the said selection parameters;

vector and alphanumeric symbol generating means for providing symbol video signals with a view to a random scan;

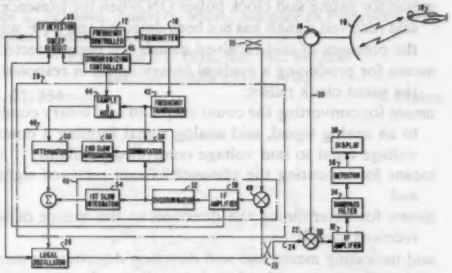
scan generating means for providing the said respective random and line-by-line scans successively; and

shade selection means comprising control means for controlling said very high voltage supply for providing a predetermined color display for the said synthetic image and for displaying the said X and Y video signals in a plurality of separate shades in at least one color, the said shades corresponding respectively to separate store allotments in said memory.

4,071,844
FREQUENCY CONTROL FOR FREQUENCY AGILE PULSE RADAR

Francis W. Hopwood, Severna Park; Lester K. Staley, Towson, and Henry D. Tolj, Lutherville, all of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 16, 1976, Ser. No. 677,647
Int. Cl.² G01S 9/02, 7/28
U.S. Cl. 343—17.2 R **8 Claims**



8. A method for frequency modulating an oscillator of a radar set in response to the frequency modulation of the radar transmitter, said method comprising:

transmitting a frequency modulated signal from the transmitter;

mixing the transmitter signal and the oscillator signal to provide an intermediate frequency signal;

controlling the average frequency of the oscillator signal in response to the average frequency of said intermediate frequency signal; and

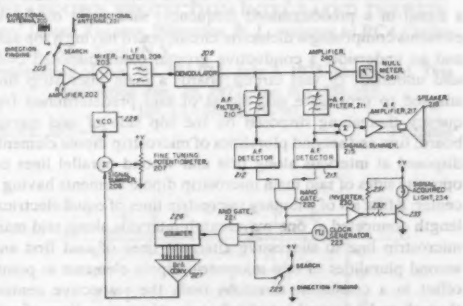
determining the average value of the commutation of the intermediate frequency signal with respect to the frequency modulation of said transmitter;

modulating the average frequency of said oscillator in response to the frequency modulation of said transmitter and in response to the average value of the commutated intermediate frequency signal.

4,071,845
HARBOR RADIO NAVIGATION SYSTEM

Fritz A. Gross, Weston, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Mar. 31, 1975, Ser. No. 563,873
Int. Cl.² G01S 5/02
U.S. Cl. 343—113 R **10 Claims**



1. A receiver for use in a radio navigation system comprising in combination:

antenna means;

means for mixing signals received by said antenna means with a local oscillator signal;

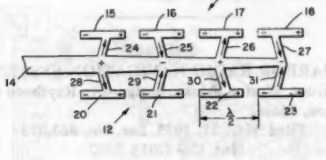
a voltage controlled oscillator for producing said local oscillator signal;
means for demodulating output signals from said mixing means;
means for simultaneously detecting the presence of a plurality of modulation components in received signals at an output of said demodulating means, each of said modulation components being of a different frequency;
a source of clock pulses;
means for gating said clock pulses ON when the presence of said received signals has not been detected and OFF when the presence of said received signals has been detected;
means for producing a cyclical binary count in response to the gated clock pulses;
means for converting the count output of said binary counter to an analog signal, said analog signal forming a control voltage input to said voltage controlled oscillator;
means for indicating the presence of said received signals; and
means for determining the direction to the source of said received signals;
said indicating means and said direction determining means operating independently of the phase of said received signals.

4,071,846

WIRED MICROSTRIP LINEAR ARRAY OF DIPOLES

Henry G. Oltman, Jr., Woodland Hills, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed June 14, 1976, Ser. No. 695,359
Int. Cl.² H01Q 9/38
U.S. Cl. 343—700 MS **8 Claims**



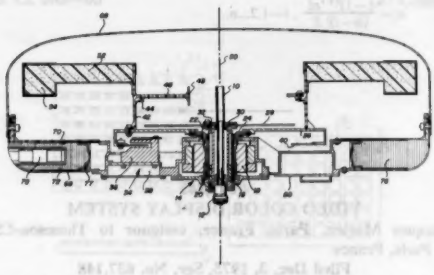
3. A wired microstrip array of dipole elements for radiating a signal of a predetermined frequency, said array of dipole elements comprising a dielectric circuit board having a top side and an underside; a conductive ground plane disposed over said underside of said circuit board; a main microstrip line adapted to propagate said signal of said predetermined frequency therealong disposed on the top side of said circuit board; first and second pluralities of microstrip dipole elements disposed at intervals along first and second parallel lines on opposite sides of said main microstrip dipole elements having a center; a first set of tributary microstrip lines of equal electrical length connected at one wavelength intervals along said main microstrip line to successive alternate ones of said first and second pluralities of said microstrip dipole elements at points offset in a consistent direction from the respective centers thereof; and a second set of tributary microwave lines of said equal electrical length connected along said main microstrip line midway between each line of said first set thereof to successive remaining ones of said first and second pluralities of microstrip dipole elements at points offset in a direction opposite to said consistent direction from the respective centers thereof.

4,071,847

RADIO NAVIGATION ANTENNA SYSTEM

Sidney Pickles, Colusa, Calif., assignor to E-Systems, Inc., Dallas, Tex.

Filed Mar. 10, 1976, Ser. No. 665,619
Int. Cl.² H01Q 3/12
U.S. Cl. 343—761 **16 Claims**



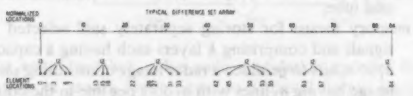
1. An antenna system for radiating energy above the horizon and energized from a radio frequency source, comprising in combination:
a central radiator coupled to the radio frequency source,
a first plurality of spaced, reflector elements radially positioned from said central radiator,
a second plurality of spaced, reflector elements positioned between said central radiator and said first plurality of reflector elements,
a first counterpoise system disposed around said central radiator for upwardly reflecting radiation from said central radiator, and
a second counterpoise system axially displaced from said first counterpoise system for providing added uplift to radiated signals and decreasing the total energy radiated below the horizon, said second counterpoise system comprising
an upper reflecting surface, and
a lower reflecting surface mounted parallel to and electrically interconnected with said upper reflecting surface.

4,071,848

THINNED APERIODIC ANTENNA ARRAYS WITH IMPROVED PEAK SIDELOBE LEVEL CONTROL

David Garth Leeper, Middletown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 26, 1976, Ser. No. 745,231
Int. Cl.² H01Q 21/00; H04B 7/00
U.S. Cl. 343—844 **7 Claims**



1. A thinned aperiodic antenna array with improved peak sidelobe level control comprising:
a plurality of antenna elements disposed in a linear array at locations having spacings which are both integer multiples of a predetermined distance and members of a set of integers $D = \{d_1, d_2, \ldots, d_k\}$, said set of integers D being determined in accordance with the equation for difference sets as given by

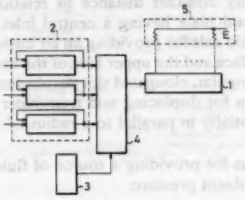
$$d_i - d_j = \alpha \text{ (modulo } v\text{)},$$

where v is an integer and is greater than k and for an integer $0 < \alpha < (v-1)$ said equation has exactly Λ solution pairs in said set of integers D and Λ is an integer and is less than k.

4,071,849
SYSTEM FOR PRINTING IMAGES HAVING A HALF TONE

Hitoshi Koyano; Nobuo Sugaya, and Michio Shiraogawa, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Apr. 19, 1976, Ser. No. 677,964
Claims priority, application Japan, Apr. 22, 1975, 50-48126
Int. Cl.[2] G01D *15/10*
U.S. Cl. 346—1 7 Claims

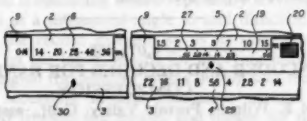


1. A method for printing images on a line by line basis, said images on each line having a plurality of gradation levels, characterized in that input image information representing the gradation levels of each picture element on a line in binary expression is memorized in a buffer memory; that information on drive time corresponding to each picture element information on said line is obtained through a selection gate circuit from an output of said buffer memory and an output of a circuit controlling the drive time of picture element reproduction elements arranged along said line and having a drive time T for producing the images on said line; that the output drive information of said selection gate circuit is memorized in memory elements corresponding one by one to said picture element reproduction elements; that those picture element reproduction elements whose memory elements memorized drive information indicating an ON drive condition are substantially simultaneously driven by their respective memory elements; whereby printed images having a plurality of gradation levels are reproduced on said line by time sharing control of the drive time of said picture element reproduction elements.

4,071,850
CAMERA LENS BARREL SUITABLE FOR FLASH PHOTOGRAPHY

Zenichi Okura, Ichikawa, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 24, 1975, Ser. No. 571,254
Claims priority, application Japan, May 9, 1974, 49-50720
Int. Cl.[2] G03B *3/00*
U.S. Cl. 354—196 6 Claims

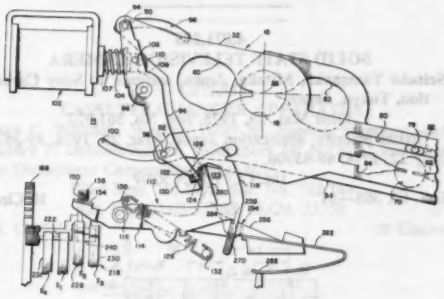


1. In a camera lens barrel suitable for use in flash photography wherein: (a) flash guide numbers are marked either on a distance adjusting ring or a diaphragm value adjusting ring; (b) the distance adjusting ring and the diaphragm value adjusting ring are formed such that the rotation angle of the distance adjusting ring required for increasing the distance gradation value by the $\sqrt{2}$ during flash photography is equal to the rotation angle of the diaphragm value adjusting ring at that time; and, (c) a clutch member including an actuation member is included and formed such that, during flash photography, the clutch member is capable of connecting the distance adjusting ring to the diaphragm value adjusting ring at a relative angular position corresponding to a flash guide number, the improvement comprising depth of field indicating means carried by said actuation member for indicating a depth of field related to the flash guide number corresponding to the relative angular position between the distance adjusting ring and the diaphragm value adjusting ring.

4,071,851
METHOD OF ADJUSTING CAMERA WITH LATCHED SHUTTER BLADE MECHANISM FOR SHIPMENT

Bruce K. Johnson, Andover, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed June 17, 1976, Ser. No. 697,058
Int. Cl.[2] G03B *19/02, 9/08*
U.S. Cl. 354—354 7 Claims

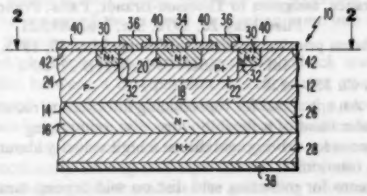


7. The method of claim 4 wherein the operation of said camera drive means is effected by a motor stationed outside said camera in driving engagement with said camera drive means, the position of said shutter button is monitored by way of a microswitch stationed adjacent the shutter button in a manner whereby the microswitch changes from one select state to another select state in response to shutter button movement from said select position and thereafter changes from said other select state to said one select state in response to shutter button movement back to said select position, and the termination of the operation of the drive means is effected by means of a control circuit which operates to deenergize the motor in response to said microswitch changing from said other select state to said one select state after which the motor is disengaged from driving engagement with the drive means.

4,071,852
TRANSISTOR HAVING IMPROVED JUNCTION BREAKDOWN PROTECTION INTEGRATED THEREIN

Peter Joseph Kannam, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 593,017, July 3, 1975, abandoned. This application Jan. 10, 1977, Ser. No. 758,185
Int. Cl.[2] H01L *29/90*
U.S. Cl. 357—13 3 Claims



1. An improved semiconductor device of the type having a collector region of one type conductivity and a base region of

a second type conductivity forming a base-collector PN junction therewith, said base region comprising a first portion having a comparatively low average resistivity and a second portion having a comparatively high average resistivity, an emitter region of said one type conductivity within said first portion, and a doped protective region of said one type conductivity adjacent said base region and forming a second PN junction therewith, said protective region being spaced apart from said collector region, wherein the improvement comprises:

said doped protective region substantially surrounding said first portion and being unconnected directly to any electrode of said device so that it 'floats' with respect to voltage potentials applied across said device; and

a base electrode contacting said first portion of said base region.

4,071,853

SOLID STATE TELEVISION CAMERA

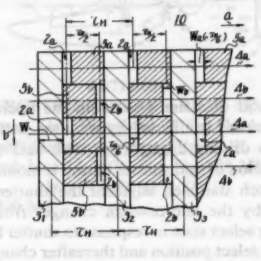
Seisuke Yamanaka, Mitaka, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 25, 1975, Ser. No. 561,922

Claims priority, application Japan, Mar. 29, 1974, 49-35281; July 22, 1974, 49-83900

Int. Cl.[2] H04N 9/04

U.S. Cl. 358—41 **10 Claims**



1. A solid state camera comprising: A solid state image sensor having a plurality of picture elements arranged in both vertical and horizontal directions, the sensing position of said picture elements in each horizontal line of successive scanning being spaced from the sensing position of picture elements in adjacent horizontal lines of successive scanning by $\tau H/2$, where τ H is an alignment pitch of said picture elements in the horizontal direction, means for projecting an image on said solid state image sensor, means coupled to the picture elements for reading out the light information stored therein, and means for processing the output from said reading means to produce a resultant video signal.

4,071,854

DEVICE FOR THE STABILIZATION OF FLEXIBLE DISCS AND MORE PARTICULARLY OF VIDEODISCS AND READING APPARATUS ADAPTED TO THIS DEVICE

Paul Bijon; Bernard Fichot, and Lucien Lainez, all of Paris, France, assignors to Thomson-Brandt, Paris, France

Filed May 25, 1976, Ser. No. 689,821

Claims priority, application France, May 30, 1975, 75 16999

Int. Cl.[2] H04N 5/76; G11B 21/20

U.S. Cl. 358—128 **8 Claims**

1. An apparatus for reproducing information recorded on an annular band of a flexible video disc, comprising:

means for driving said disc at a high velocity about an axis of rotation;

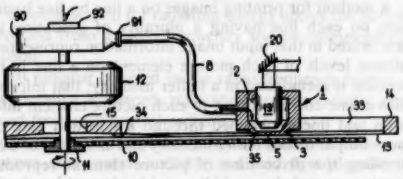
means for mounting said disc on said driving means;

a transducer head for electro-optically reproducing said recorded information having means for optically focussing a beam of coherent light and mounted for displacement along a line perpendicular to said axis of rotation from one end to another of said annular disc band; and

means for accurately positioning a portion of said disc facing said transducer head in relation to said focussing means, said positioning means including:

a fixed plate having a substantially flat lower face extending perpendicular to and substantially symmetrical to said axis of rotation and located at a predetermined distance above said disc mounting means for aerodynamically prestabilizing said disc in rotation to a substantially constant distance in relation to said lower face, said plate having a central inlet opening coaxial with said axis for providing an air cushion between said lower face and the upper face of the disc in rotation and a rectangular, elongated slot perpendicular to the axis of rotation for displacing said transducer head above and substantially in parallel to a radius of said disc in rotation;

pump means for providing a source of fluid under pressure above ambient pressure;



a fluid-tight casing for housing said transducer head connected by flexible pipe means to said pump means and including a lower portion penetrating through said slot and having a width smaller than that of said slot for providing gaps on each side thereof and a bottom face including a substantially flat, rectangular portion facing the upper face of the disc and a substantially centrally located outlet aperture for providing a passage for both said light-beam and said fluid under pressure, said bottom face of said casing being situated below the lower face of said plate at such a distance from the upper face of said disc in rotation that the force exerted by the flow of said fluid through said aperture and between said bottom face and the portionof said disc facing it is in a range where the Bernouilli force of attraction, produced by a relative pressure difference due to the deceleration of the fluid flow between the center and the periphery thereof, is predominant, whereby said facing disc portion is drawn towards said bottom face to a distance where the equilibrium is established between the forces of attraction and repulsion acting thereupon.

4,071,855

ENCODER AND DECODER FOR BANDWIDTH COMPRESSION

Michael E. Wilmer, Portola Valley, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 3, 1976, Ser. No. 663,311

Int. Cl.[2] H04N 7/12

U.S. Cl. 358—260 **6 Claims**

1. A bandwidth compression device adapted for use with a facsimile communication system comprising:

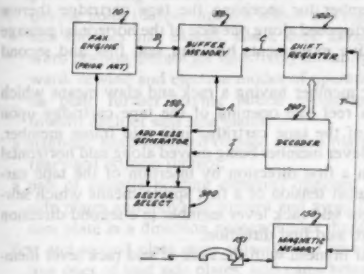
buffer means for storing in line-by-line format facsimile data;

segmenting means connected to said buffer means for selecting line sections in a column alignment from said buffer means;

coding means connected to receive said column of line sectors for producing serial signals including a first leader code when all bits in said column of line sectors are of a first polarity and a second leader code followed by a bit

serial stream of said bits in said column of line sectors when any ones of said bits are of a second polarity;

transmission means connected to receive said signal from said coding means for transmission;



expansion means connected to said transmission means for producing a serial stream of bits of said first polarity upon receipt of said first leader code; and

allocating means connected to said expansion means and said buffer means for allocating said serial bits into a preselected array of line sectors in said buffer means.

4,071,856

SERVO-CONTROL SYSTEM FOR SIGNAL RECORDING AND/OR REPRODUCING APPARATUS

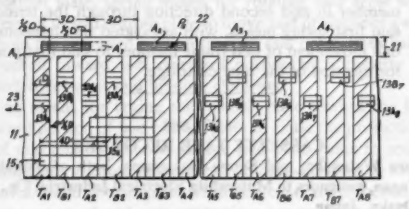
Nobutoshi Kihara, and Minoru Morio, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 25, 1976, Ser. No. 689,829

Claims priority, application Japan, May 26, 1975, 50-62663

Int. Cl.[2] G11B *15/46*

U.S. Cl. 360—73 **16 Claims**



1. In an apparatus for recording and reproducing information signals on a record medium and which includes drive means for advancing the record medium in a predetermined direction during recording and reproducing operations of the apparatus, signal transducing means repeatedly traversing the record medium at a substantial angle to said direction of advancement of the record medium so as to scan successive parallel tracks on the latter, means for applying information signals to said signal transducing means during said recording operation for recording in said successive parallel tracks scanned by said transducing means, and means for deriving reproduced information signals from said signal transducing means when the latter scan said successive parallel tracks during said reproducing operation: a servo-control system for ensuring accurate scanning of said successive parallel tracks by said signal transducing means during said reproducing operation comprising pilot signal recording means operative during said recording operation of the apparatus for recording uniform pilot signals in areas on the record medium that are spaced apart in said direction of advancement and also traversed by said signal transducing means, with each of said areas having an extent in said direction of advancement that corresponds to the extent in said direction of advancement of a respective plurality of said successive parallel tracks being scanned by said signal transducing means during said recording operation, and with each of said areas further being in a predetermined positional relation, in said direction of advancement, to said respective plurality of parallel tracks; means operative during said reproducing operation of the apparatus for deriving a reproduced pilot signal from said signal transducing means during each traversal by the latter of each of said areas on the record medium; means for comparing the reproduced pilot signals derived from said signal transducing means during two different traversals of each one of said areas by said signal transducing means and providing a control signal on the basis of the comparison; and means responsive to said control signal for regulating said advancement of the record medium relative to the repeated traversing thereof by said signal transducing means.

4,071,857

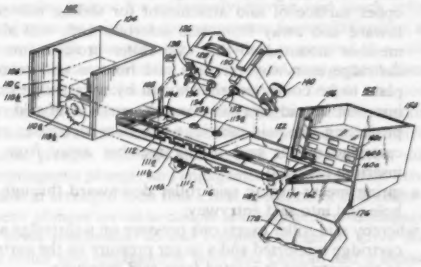
CASSETTE CHANGER APPARATUS

James C. Whitney, Weston; Willy M. Sander, Stamford, and Andre T. Debaudringhien, Bridgeport, all of Conn., assignors to Dictaphone Corporation, Rye, N.Y.

Filed Sept. 10, 1976, Ser. No. 722,144

Int. Cl.[2] G11B *15/68, 15/24, 23/08*

U.S. Cl. 360—92 **20 Claims**



1. Cassette changer apparatus for use in a multiple cassette record and/or playback device, comprising:

an input magazine for storing a stack of cassettes disposed therein one atop the other, each cassette including a housing for magnetic tape and respective apertures through which said tape is accessed for a recording or playback operation;

an output magazine spaced from said input magazine for storing a stack of cassettes disposed therein one atop the other;

a record/playback station disposed intermediate said input and output magazines;

endless conveyor means for conveying a cassette from said input magazine to said record/playback station and then from said record/playback station to said output magazine;

loading means at said output magazine for receiving said cassette conveyed thereto and for loading same into said stack therein;

a record/playback deck at said record/playback station movable between a first position spaced from a cassette conveyed to said record/playback station and a second position in operative relation with respect to said cassette, said record/playback deck including tape drive means for bi-directionally driving said tape housed within said cassette and a magnetic transducer for recording information on and/or reproducing information from said tape; and

deck drive means for moving said record/playback deck between said first and second positions.

4,071,858

CARTRIDGE EJECTION PREVENTING DEVICE

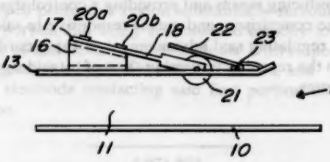
Kazushige Ejiri, Iwaki, Japan, assignor to Alps Motorola, Inc., Tokyo, Japan

Filed Mar. 15, 1977, Ser. No. 777,737

Claims priority, application Japan, Apr. 6, 1976, 51-42338[U]

Int. Cl.[2] G11B *15/00*

U.S. Cl. 360—93 **10 Claims**



1. In an apparatus for recording and/or playing a magentic tape contained in a cartridge and including a cartridge entryway with an insertion end for receiving a cartridge and a retaining plate outside of said cartridge entryway, the combination comprising:

said retaining plate outside of said entryway formed with a hole;

an attachment attached to said retaining plate and having an upper inclined surface;

a sliding member having a front end provided with a roller, means mounting said sliding member on said inclined upper surface of said attachment for sliding movement toward and away from said insertion end, said sliding member mounted so that said roller projects into said cartridge entryway through said hole in said retaining plate to be contacted and moved by a cartridge during insertion in said entryway and the amount of said roller projecting into said cartridge entryway decreases as the cartridge moves said sliding member away from said insertion end; and

a spring means urging said roller downward through said hole and into said entryway;

whereby said roller exerts one pressure on a cartridge as the cartridge is inserted and a larger pressure on the cartridge as the cartridge is ejected from said entryway.

4,071,859

TAPE CARTRIDGE POSITIONING AND EJECTION DEVICE

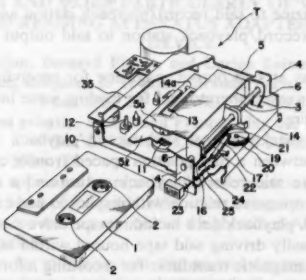
Yasuo Sami, Moriguchi, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Aug. 13, 1976, Ser. No. 714,233

Claims priority, application Japan, Aug. 19, 1975, 50-115527[U]; Oct. 16, 1975, 50-141311[U]

Int. Cl.[2] G11B *15/66, 21/22*

U.S. Cl. 360—96 **6 Claims**



1. A tape cartridge positioning and ejection device for use in a magnetic tape recording and reproduction apparatus of a type wherein a tape cartridge loaded along a horizontal passage into the apparatus is selectively moved between a first position for insertion and ejection of the tape cartridge and a second position for recording and reproduction thereof, said tape cartridge positioning and ejection device comprising;

a frame member for receiving the tape cartridge therein pivotally disposed along one side of the horizontal passage for selective movements between said first and second positions,

a rack lever member having a rack and claw means which engages a reel hub opening of the tape cartridge upon insertion of the tape cartridge into said frame member, said rack lever member being moved along said horizontal passage in a first direction by insertion of the tape cartridge against tension of a first spring means which normally urges said rack lever member in a second direction opposite to said first direction,

a pinion gear in mesh with the rack of said rack lever member,

a crank lever member pivotally connected at one end thereof to an eccentric point on said pinion gear, and

a second spring means having tension larger than that of said first spring means for urging said crank lever member in said second direction, said rack lever member being moved in said first direction by insertion of the tape cartridge into said frame member thereby rotating said pinion gear a predetermined degree in one direction to bring said crank lever member into crank motion through tension of said second spring means, said pinion gear further moving said rack lever member in said first direction in an attracted manner through said crank motion to bring the tape cartridge into a fully inserted position, frame locking means providing associated simultaneous pivotal movement of said frame member to said second position upon said full insertion, cartridge ejection means reduce the tension of said second spring means thereby rotating said pinion gear in the other direction to return said rack lever member in said second direction through the tension of said first spring means, with associated simultaneous pivotal movement of said frame member to said first position for ejection of the tape cartridge.

4,071,860

CASSETTE TAPE RECORDER

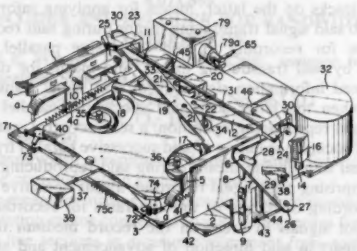
Kaoru Watanabe, and Syogo Nakayama, both of Yokohama, Japan, assignors to Matsushita Electrical Industrial Co., Ltd., Osaka, Japan

Filed Mar. 17, 1976, Ser. No. 667,561

Claims priority, application Japan, Mar. 20, 1975, 50-34131; Mar. 20, 1975, 50-38169[U]; Nov. 6, 1975, 50-133816; Nov. 20, 1975, 50-139893

Int. Cl.[2] G11B *23/04, 15/10, 19/26*

U.S. Cl. 360—96 **8 Claims**



1. A cassette recorder having cassette insertion, record/play-back, fast-forward, rewind, and eject modes of operation, said recorder comprising:

a bottom plate having forward and rearward portions and

side plates substantially perpendicular to said bottom plate on each side thereof;

a chassis plate parallel to said bottom plate and movable over said bottom plate in forward and rearward directions, said chassis plate being rotatable with respect to said bottom plate in sliding contact therewith, said chassis plate also having holes therein through which driving capstans and reel spindles may extend, and a knob affixed to the forward portion thereof for selectively initiating said fast-forward, rewind and ejection modes of operation, said chassis plate further having lateral projections extending toward each of said side plates;

a magnetic head mounted on said chassis plate adjacent the rearward portion thereof;

a pair of cassette holding elements disposed between said side plates and movable toward and away from said bottom plate in a direction perpendicular thereto;

first and second plate cams adjacent and parallel to respective ones of said side plates, said cams being coupled for synchronized rotation about an axis perpendicular to said side plates;

means for coupling each of said plate cams to an adjacent one of said cassette holding elements, so that rotation of said cams results in movement of said elements toward and away from said bottom plate in said given direction;

first and second arms arranged in the form of an X, one end of each of said arms being pivotably mounted to said bottom plate adjacent the rearward portion thereof, the free end of each of said arms comprising a cassette detecting projection, the ends of said arms pivoted to said bottom plate having stopping members for engaging said plate cams to lock said cams in a predetermined rotational position when said projections are relatively remote from the rearward portion of said bottom plate, and for releasing said plate cams from said locked stated when said projections are adjacent said rearward portion of said bottom plate, spring means for rotating said arms with respect to said bottom plate to move said projections away from the rearward portion thereof, said projections being pushed toward said rearward portion by a cassette inserted between said holding elements;

spring means for urging said chassis plate toward the forward portion of said bottom plate to cause the projections of said chassis plate to engage said plate camz to rotate said cams to cause said cassette holding elements to move toward said bottom plate when said cams are unlocked by movement of said arm projections toward the rearward portion of said bottom plate, said recorder being simultaneously placed in the record/play-back mode;

means responsive to the movement of said knob toward said bottom plate to place said recorder in the eject mode, said movement of said knob resulting in corresponding movement of said chassis plate and rotation of said cams, said rotation of said cams resulting in (i) movement of said lateral projections and said chassis plate a predetermined distance toward the forward portion of said bottom plate and (ii) movement of said cassette holding elements away from said bottom plate in said given direction, whereby any cassette disposed between said holding elements is ejected;

means responsive to rotation of said knob and chassis plate in one direction for limiting the angle of such rotation by engagement between said lateral projections and said cams and for placing said recorder in a selected one of said fast-forward and rewind modes; and

means responsive to rotation of said knob and chassis plate in the other direction for limiting the angle of rotation in said other direction by engagement of said lateral projections with said cams, and for simultaneously placing said recorder in the other of said fast-forward and rewind modes.

4,071,861

MAGNETIC RECORDING AND REPRODUCING SYSTEM

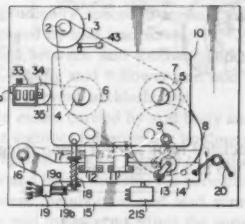
Huminori Hirose, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed June 23, 1976, Ser. No. 698,919

Claims priority, application Japan, June 24, 1975, 50-78890; Oct. 13, 1975, 50-123557

Int. Cl.[2] G11B *15/24, 21/22;* B65H *17/22*

U.S. Cl. 360—96 **13 Claims**



1. A magnetic recording and reproducing system comprising a capstan, reel shafts, motor means operative when connected to a voltage source, coupling means for transmitting the rotational force of said motor to said capstan and reel shafts, a pinch roller for pressing a magnetic tape to said capstan, an engagement-disengagement drive mechanism responsive to said coupling means for selectively driving said pinch roller into engagement with and disengagement from said capstan, an electromagnetic plunger operative when connected to a voltage source to cause an initial motion of said engagement-disengagement drive mechanism which serves to couple said coupling means to said engagement-disengagement drive mechanism, and operation switch means for connecting said electromagnetic plunger and said motor to a voltage source, said electromagnetic plunger and engagement-disengagement drive mechanism arranged such that a first operation of said electromagnetic plunger serves to couple said engagement-disengagement drive mechanism to said coupling means to drive said pinch roller into engagement with said capstan and a second operation of said electromagnetic plunger serves to couple said engagement-disengagement drive mechanism to said coupling means to disengage said pinch roller from said capstan.

4,071,862

DISC CARTRIDGE

Francis O. Lathrop, Jr., Amherst, N.H.; Edward H. Jacobs, Westboro, Mass.; William E. Wood, Hudson, Mass., and Patrick A. Taylor, Framingham, Mass., assignors to Nashua Corporation, Nashua, N.H.

Filed Mar. 1, 1976, Ser. No. 662,332

Int. Cl.[2] G11B *17/26, 23/02;* B65D *85/38*

U.S. Cl. 360—97 **15 Claims**

1. In a disc cartridge for a magnetic disc, the cartridge comprising

an assembly including

a. a top cover on a first side of said magnetic disc

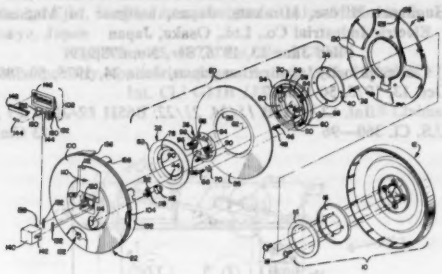
b. an inside cover on the second side of said magnetic disc, and

c. means securing said inside cover to said top cover; and

a bottom cover releasably securable to said assembly to enclose said inside cover;

the improvement wherein said means securing said inside cover to said top cover comprise a plurality of pairs of

mating hooks and hook anchors, the hook of each pair being integral with one of said top and inside covers and



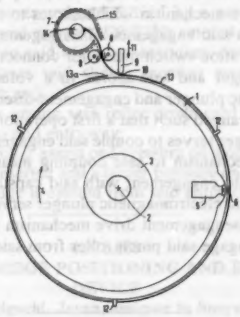
the associated hook anchor being integral with the other of said top and inside covers.

4,071,863

STATIONARY MAGNETIC TAPE TRANSDUCING SYSTEM WITH MEANS FOR CONTROLLING THE AIR BEARING SUPPORT

Mircea Alexandrescu, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed June 21, 1976, Ser. No. 698,416
Claims priority, application Germany, Oct. 6, 1975, 2544667
Int. Cl.[2] G11B *21/02, 15/64, 15/66*
U.S. Cl. 360—101 **2 Claims**



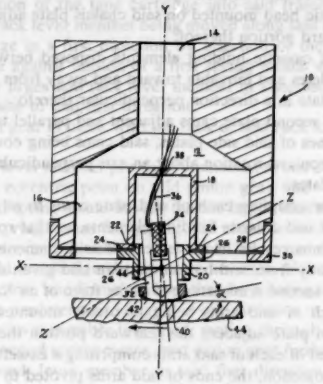
1. A magnetic tape system providing transducing of a stationary length of magnetic tape having a free end and a fixed end including a cylinder having a cylindrical periphery for receiving a length magnetic tape thereabout, and a transducer head mounted for rotary movement about a head rotational axis during transducing operation with respect to a magnetic tape extending about the periphery of said cylinder, said cylinder being rotatably mounted for rotation on an axis corresponding to said rotational axis, a drive motor connected to said cylinder for driving said cylinder at such a rotational speed that an air cushion is formed between the periphery of the cylinder and a magnetic tape extending about said periphery, and tape constraining means adjustably determining the distance between the periphey of the cylinder and a tape extending thereabout, the transducer head being disposed with respect to the periphery of the cylinder to be in operative scanning relation to a magnetic tape as positioned by said tape constraining means, said tape constraining means comprising a guide bar with a tape guide edge adjustable toward and away from the cylinder periphery, drive means for inserting the free end of the magnetic tape between the cylinder periphery and the tape guide edge of said guide bar, whereby the free end of the magnetic tape, upon insertion between the tape guide edge and the cylinder periphery, is drawn about the cylinder periphery by the resulting air flow.

4,071,864

FLEXIBLE RECORDING HEAD MOUNTING ASSEMBLY

Raymond J. Zapala, Anaheim, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 16, 1976, Ser. No. 649,761
Int. Cl.[2] G11B *5/60, 5/48, 17/32;* G11R *21/20*
U.S. Cl. 360—103 **1 Claim**



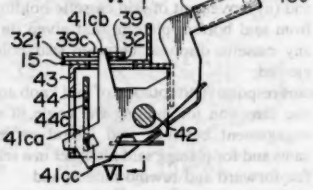
1. A flexible recording head mounting assembly for information recording systems having one moving member positioned in a close spaced relationship comprising: a housing; a cylindrically shaped chamber open at one end and reduced to a passage at the other end, in the housing; a flexible diaphram positioned across the open end of the chamber; a cup shaped means within the chamber extending through the diaphram and secured thereto; a recording head pivotally mounted to said cup-shaped means and a shoe means affixed to the recording head and adjacent an end distally from the pivot mount and having a cylindrical surface whose center line is offset from the recording head whereby the head will be inclined to the moving member and spaced therefrom by a hydrodynamic bearing created by said inclination.

4,071,865

CASSETTE TAPE RECORDER

Seikoh Nakasuna, Katsuta, Japan, assignor to Hitachi, Ltd., Japan

Filed May 27, 1976, Ser. No. 690,588
Claims priority, application Japan, May 30, 1975, 50-64276
Int. Cl.[2] G11B *21/22, 5/54, 15/22*
U.S. Cl. 360—105 **8 Claims**



1. A cassette tape recorder of the kind using a cassette including a housing which has an upper wall, a lower wall, a front wall, a rear wall, and a pair of side walls, and in which a magnetic tape wound around one of a pair of hubs supported

freely rotatably between the upper and lower walls with one end thereof fixed to that hub is guided toward the other hub along a path extending adjacent to a plurality of openings bored in the front wall to be wound around the other hub with the other end thereof fixed to the latter hub, the tape being adapted to be fed at a predetermined take-up speed during recording and reproduction, comprising:

a base;

a supply turntable and a take-up turntable mounted freely rotatably to said base and having a center-to-center distance equal to that of said hubs in said cassette;

means mounted to said base for positioning and maintaining said cassette in a predetermined cassette mounting position such that said cassette is positioned with its front wall directed toward the rear side of said base and said hubs are brought into rotating engagement with said supply and take-up turntables respectively;

a slide member arranged for sliding movement and carrying at least a recording-reproducing head and a pinch roller at positions opposite to the openings in the front wall of said cassette maintained in the predetermined cassette mounting position;

guide means mounted on said base member with respect to guide slots formed in said slide member for guiding said slide member in its movement toward and away from the front side of said base;

spring means for biasing said slide member away from the front side of said base to hold said recording-reproducing head and said pinch roller spaced from said cassette;

a pivot disposed beneath said base on the rear wall side of said cassette;

a play button lever pivoted to said pivot for swinging movement around said pivot, said play button lever including an outwardly protruding portion mounted to a play button and an upwardly extending portion extending upwardly through a slot in said base and a slot formed in said slide member, whereby said upwardly extending portion contacts said slide member and presses said slide member toward the front side of said base to bring the at least one recording-reproducing head and pinch roller into an operative position in response to depression swinging movement of said play button against the biasing force of said spring means; and

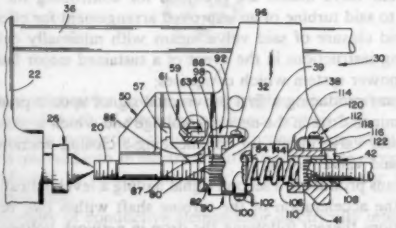
means for feeding said tape at the predetermined take-up speed toward said take-up turntable by operating in interlocking relation with the swinging movement of said play button.

4,071,866

DISC RECORDER DRIVE FOLLOWER ASSEMBLY

Otto R. Butsch, Ann Arbor, Mich., assignor to Sycor, Inc., Ann Arbor, Mich.

Filed Mar. 16, 1977, Ser. No. 778,143
Int. Cl.[2] G11B *21/08*; F16H *55/18*
U.S. Cl. 360—106 **19 Claims**



1. A head carriage for a disc recorder of the type including a frame supporting a lead screw by which said carriage is translated and a guide rod positioned in vertically spaced, parallel relation to the lead screw, said head carriage comprising:

a one-piece body defining a longitudinal bore dimensioned greater than the lead screw and including a stop at one end, said body further defining a glide passage dimensioned to receive the guide rod;

an internally threaded follower held within said bore and threadably engaged by the lead screw, said follower contacting the stop at one end and held against rotation relative to said body;

an internally threaded adjustment member disposed within said bore longitudinally spaced from said follower and threadably engaged by said lead screw;

a spring positioned between said follower and said adjustment follower, biasing said follower and said adjustment member apart to prevent backlash; and

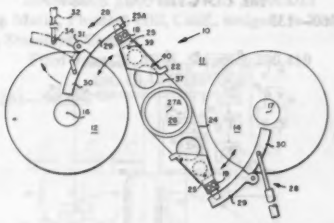
manually shiftable means carried by said body and engaging said adjustment member for normally holding said adjustment member against rotation relative to said carriage on said lead screw and being shiftable for permitting rotation of said adjustment member on said lead screw towards and away from said follower to adjust the spring preload.

4,071,867

APPARATUS FOR ALIGNING THE HEAD-ARM ASSEMBLIES OF A ROTARY ACTUATED DISC DRIVE

Ivan Pejcha, 428 Montclair Drive, Santa Clara, Calif. 95051

Filed Sept. 16, 1974, Ser. No. 506,126
Int. Cl.[2] G11B *5/56, 21/24, 5/54, 21/22*
U.S. Cl. 360—109 **5 Claims**



1. In a disc drive apparatus adapted to transfer data located in concentric tracks on a rotating magnetic disc having a disc surface, the combination of: a recording head interacting with the disc when energized for transferring data therebetween; a support arm on which said head is carried for movement in a planeparallel to said disc surface; said support arm having two sections, actuator means connected to the support arm for moving the arm along an arcuate path in said plane to position the head at any selected track on the disc surface; and adjustment means operatively interconnecting said two sections of the support arm for adjustably displacing said two sections relative to each other in said plane to position the head in spaced relation to the actuator means to set the precise location of the head in said plane over a selected track on the disc in any position of te actuator means.

4,071,868

NARROW TRACK MR HEAD WITH SIDE SHIELDS

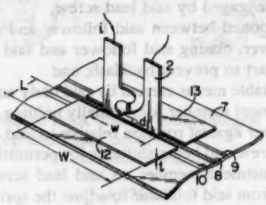
Nobuyuki Kaminaka, Moriguchi; Kenji Kanai, Neyagawa; Norimoto Nouchi, Katano, and Noboru Nomura, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 16, 1975, Ser. No. 641,185

Claims priority, application Japan, Dec. 20, 1974, 49-147385; Dec. 20, 1974, 49-147386; Dec. 31, 1974, 50-1687; Dec. 31, 1974, 50-1688; Jan. 9, 1975, 50-5330

Int. Cl.² G11B *5/12, 5/30*

U.S. Cl. 360—113 **7 Claims**



1. A magnetic head for use with a record medium having at least one track therein, comprising:

a magnetic circuit element including,

a ferromagnetic material section having a magnetic gap, and

a magnetoresistive effect element section situated in the same plane as said ferromagnetic material section, and

ferromagnetic shielding plates positioned on both sides of said magnetic circuit element, the thickness direction of said magnetic circuit element coinciding with the width direction of a track in said record medium.

4,071,869

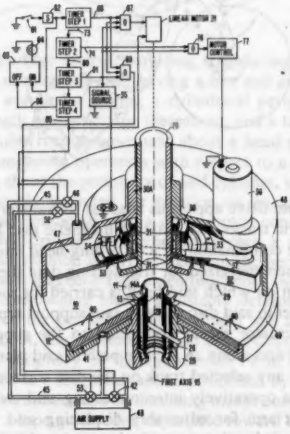
ASSEMBLING FLEXIBLE DISK RECORD STRUCTURES

Louis Bock Feierabend, Boulder, and David Staples Proper, Arvada, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 1, 1976, Ser. No. 691,806

Int. Cl.² G11B *5/82, 5/86*

U.S. Cl. 360—135 **11 Claims**



1. Manufacturing apparatus, comprising:

a frame;

a circular platen on said frame and for supporting a flexible magnetic record member;

first means on said frame and being coaxial to said platen for centering said flexible magnetic record member with respect to a first axis;

second means on said frame and being coaxial to said first means and axially movable with respect thereto and for receiving a non-flexible circularly ring shaped member;

a press on said frame and coaxial to said first axis and axially relatively movable therealong between open and closed positions with respect to said circular platen;

actuating means for relatively moving said press against said second means and said platen for permanently adhering said ring member to said record member in a coaxial relationship; and

recording means coaxially disposed to said first axis for recording predetermined circumferentially extending magnetic signals on said record member while stationarily disposed on said platen and after said members are secured to each other.

4,071,870

APPARATUS TO GENERATE MINIMALLY DELAYED INSTRUCTIONS FOR TURBINE VALVES IN THE EVENT OF POWER SYSTEM SHORT CIRCUITS

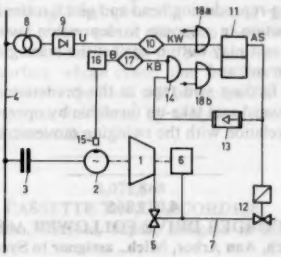
Heinz Bloch, Nussbaumen, and Ernst Wirth, Baden, both of Switzerland, assignors to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Mar. 25, 1975, Ser. No. 561,693

Claims priority, application Switzerland, May 31, 1974, 07489/74

Int. Cl.² H02H *7/06*

U.S. Cl. 361—21 **5 Claims**



1. The combination with a turbo-set comprising a turbine shaft coupled to an alternating current electrical generator whose output is delivered to a high-voltage power system and wherein valve means are provided for controlling the fluid flow to said turbine of an improved arrangement for effecting a rapid closure of said valve means with minimally delayed closing instructions in the event of a sustained major fault on said power system which comprises;

means producing a first provisional signal upon a predetermined drop in the network voltage and which is passed to said valve means for commencing a closing operation of said valve means,

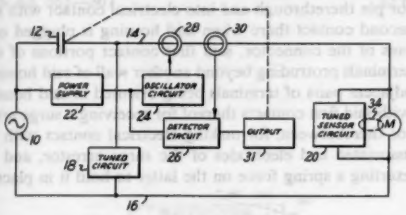
means producing a second signal having a level indicative of the acceleration of the turbine shaft within two revolutions thereof following the drop in network voltage, and

means responsive upon a failure of said second signal to reach a predetermined level for cancelling out said first signal thereby terminating the closing operation of said valve means.

4,071,871
MOTOR PROTECTOR CIRCUIT

Robert C. Kochem, Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 29, 1975, Ser. No. 644,794
Int. Cl.[2] H02H 7/08
U.S. Cl. 361—27 13 Claims



1. A circuit for detecting overtemperature conditions in a load, comprising:

first and second AC power supply lines for energizing a load,

tuned circuit means connected across the first and second power lines,

oscillator circuit means for impressing a signal having a selected frequency in said tuned circuit means,

detector circuit means for detecting said signal,

power supply means coupled to said oscillator circuit means and detector circuit means,

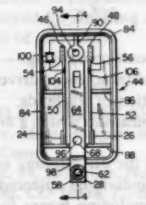
thermally responsive switch means having first and second states electrically coupled to the tuned circuit means so that in one state the impedance of the tuned circuit means is at a level precluding resonance therein while in the other state the impedance of the tuned circuit means is at a level causing resonance therein, the thermally responsive switch adapted to be thermally coupled to the load whereby overtemperature conditions in the load will cause the thermally responsive switch to change from one state to the other, and

output means coupled to said detector circuit means providing an output signal when the tuned circuit means is in resonance.

4,071,872
INTERRUPTER

Charles M. Phillips, Jr., 315 Haven St., Clearwater, Fla. 33516

Filed Aug. 12, 1976, Ser. No. 713,844
Int. Cl.[2] H02H 3/20
U.S. Cl. 361—56 3 Claims



1. An interrupter device for interrupting electrical current used by a household electrical appliance comprising:

a housing supporting a plurality of prong means adapted to be inserted into an electrical outlet and a female receptacle adapted to receive the electrical plug connector of an appliance;

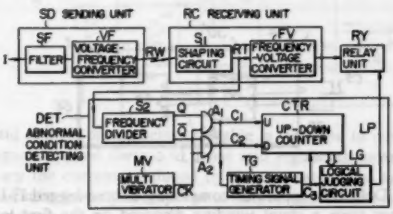
a plurality of conductive elements for electrically interconnecting each of said prong means to a corresponding element of said female receptacle wherein one of said conductive elements is rectangular having an L-shaped grounding prong means extending from one end of said conductive element in a first direction and a contact portion extending from the other end of said conductive element in a direction opposite said first direction; and

spark gap means connected between two conductors of said interconnecting conductor means for interrupting current flow to said female receptacle at a predetermined voltage level by creating a path of low resistance between said two interconnecting conductor means.

4,071,873
APPARATUS FOR DETECTING ABNORMAL CONDITIONS OF TRANSMITTED SIGNALS

Fumio Andow, Hachioji; Mitsuru Yamaura, Fuchu, and Minoru Kitagawa, Hiroshima, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki and Chugoku Denryoku Kabushiki Kaisha, Hiroshima, both of, Japan

Filed June 21, 1976, Ser. No. 697,756
Int. Cl.[2] H02H 3/28
U.S. Cl. 361—64 18 Claims

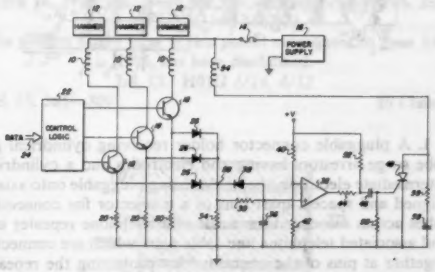


1. In apparatus for detecting an abnormal condition of a transmitted signal of the class wherein a carrier wave frequency modulated by an electric quantity is transmitted to a receiving station and the frequency variation of said carrier wave is detected by an abnormal condition detector installed in said receiving station so as to detect an abnormal condition of the transmitted signal, the improvement wherein said abnormal condition detector comprises means for comparing the length of contiguous or closely adjacent periods of the received carrier wave.

4,071,874
HAMMER PROTECTION CIRCUIT

Fereidoon Matin, Pleasant Hill, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed June 28, 1976, Ser. No. 700,419
Int. Cl.[2] H02H 3/08
U.S. Cl. 361—94 9 Claims



1. A hammer protection circuit for automatically disconnecting a power supply from a hammer actuating coil in order to cut-off current flow through said coil when said current flow is either greater than a predetermined level or present for greater than a predetermined time interval, said circuit comprising:

charging means coupled to said coil for charging up to a voltage level proportional to the level and duration of said current flow through said coil;

comparator means coupled to said charging means for comparing said voltage level with a reference voltage and for generating an output signal when said voltage level bears a predetermined relationship toward said reference voltage; and

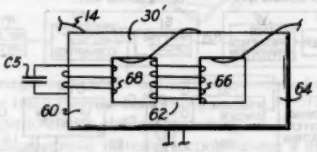
means coupled to said comparator means and to said power supply and responsive to said output signal for disconnecting said power supply from said coil.

4,071,875

DETECTOR APPARATUS

Robert C. Kochem, Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 29, 1975, Ser. No. 644,793
Int. Cl.² H02H 7/08
U.S. Cl. 361—113 **4 Claims**



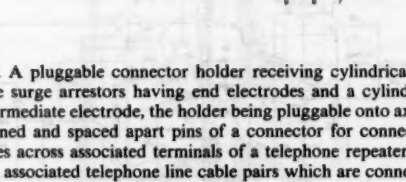
1. Detection apparatus comprising a three legged E-I transformer core, a shunt winding disposed on the first leg, frequency selective means electrically coupled to the shunt winding, signal sensing means inductively coupled to the second leg and a carrier signal line trained through the core forming two turns, one turn disposed between the first and second legs and the second turn disposed between the second and third legs.

4,071,876

PLUGGABLE PROTECTOR HOLDER FOR SURGE ARRESTOR GAS TUBES

Wayne J. Benson, Belmont; Roy B. Torburn, Palo Alto, and Donald G. Tweed, Mountain View, all of Calif., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Dec. 17, 1976, Ser. No. 751,637
Int. Cl.² H02H 7/20
U.S. Cl. 361—119 **10 Claims**



1. A pluggable connector holder receiving cylindrical gas tube surge arrestors having end electrodes and a cylindrical intermediate electrode, the holder being pluggable onto axially aligned and spaced apart pins of a connector for connecting tubes across associated terminals of a telephone repeater unit and associated telephone line cable pairs which are connected together at pins of the connector for protecting the repeater unit from surge voltages such as are induced by lightning onto a cable pair, comprising:

a plurality of electrically conductive spring terminals, each terminal having a first spring contact portion for making electrical connection with an end electrode of a surge arrestor tube and providing a spring type restraining force against the latter, and which is electrically connected through an arm portion to a second spring contact portion formed for receiving and making electrical connection with a pin of the connector; and

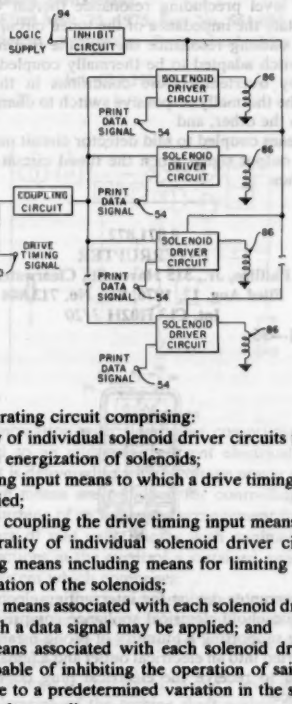
an elongated electrically nonconductive housing having a plurality of axially aligned compartments formed therein, each compartment containing the second contact portion of an associated terminal and having an opening through one wall of said housing for passing an associated connector pin therethrough and into electrical contact with said second contact there when said housing is plugged onto pins of the connector, said first contact portions of said terminals protruding beyond another wall of said housing, adjacent pairs of terminals being oriented in said housing with said first contacts thereof for receiving a surge arrestor therebetween, for making electrical contact with the associated end electrodes of the surge arrestor, and for exerting a spring force on the latter to hold it in place.

4,071,877

DRIVE CIRCUIT

John W. Stewart, and Ronald L. Bruckner, both of Wichita, Kans., assignors to NCR Corporation, Dayton, Ohio

Filed Oct. 31, 1975, Ser. No. 627,736
Int. Cl.² H01H 47/32
U.S. Cl. 361—152 **17 Claims**



1. An operating circuit comprising:

a plurality of individual solenoid driver circuits for controlling the energization of solenoids;

drive timing input means to which a drive timing signal may be applied;

means for coupling the drive timing input means to each of the plurality of individual solenoid driver circuits, said coupling means including means for limiting the time of energization of the solenoids;

data input means associated with each solenoid driver circuit to which a data signal may be applied; and

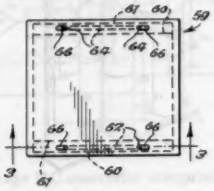
inhibit means associated with each solenoid driver circuit and capable of inhibiting the operation of said circuit in response to a predetermined variation in the supply voltage for the coupling means;

whereby an individual solenoid driver circuit to which a data signal is applied may be operated at a time and for a duration determined by a drive timing signal so long as the supply voltage for the coupling means is within acceptable limits.

4,071,878
METHOD FOR PRODUCING CAPACITORS AND CERAMIC BODY THEREFORE

James A. Stynes, Lewiston, N.Y., assignor to N L Industries, Inc., New York, N.Y.

Filed Feb. 18, 1975, Ser. No. 550,828
Int. Cl.[2] H01G 1/147
U.S. Cl. 361—307 22 Claims



1. A process for forming a multilayer capacitor which comprises: providing a unitary, sintered ceramic matrix comprising a plurality of superposed thin strata of dense dielectric material, said strata being integrally joined around the peripheries thereof to form a monolithic body, major portions of a plurality of said strata being spaced to provide between said spaced portions thin, void electrode regions adapted to be filled with metal, said matrix having a pair of laterally spaced first holes passing through the top or bottom stratum thereof, and second holes aligned with said first-mentioned holes passing through other of said strata to provide access from the exterior of said matrix to said void electrode regions; securing wire leads in said holes with an end of each wire projecting from said body, providing electrodes in said electrode regions by introducing molten metal into said regions through said holes and around said leads and solidifying the metal therein in electrical contact with said leads, said metal having a melting point lower than the temperature employed for sintering said matrix and lower than the melting point of said leads.

4,071,879
REVERSIBLE CURRENT APPARATUS

Jerry L. Falk, Medway, Mass., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Nov. 19, 1976, Ser. No. 745,802
Int. Cl.[2] H03K 17/66
U.S. Cl. 361—245 11 Claims

1. Apparatus for producing a reversible current including in combination

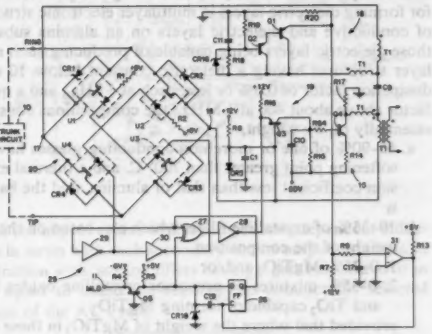
a pair of output terminals;

current source means for producing a DC current of one polarity;

current reversing means connected to said pair of output terminals and to said current source means, said current reversing means being operable to couple said current source means to said output terminals so as to produce a DC output current of one polarity between said output terminals, and being operable to couple said current source means to said output terminals so as to produce a DC output current of the opposite polarity between said output terminals;

regulating means coupled to said current source means for varying the DC current produced by said current source means; and

control means coupled to said current reversing means, to said current source means, and to said regulating means;

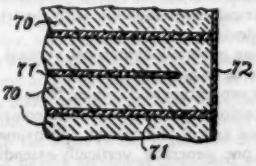


said control means being operable in response to control signals applied thereto to cause said regulating means to vary the current produced by the current source means and subsequently in response to said current source means producing a predetermined output current to cause said current reversing means to reverse the polarity of the DC current between said output terminals.

4,071,880
CERAMIC BODIES WITH END TERMINATION ELECTRODES

Truman C. Rutt, Niagara Falls, N.Y., assignor to N L Industries, Inc., New York, N.Y.

Division of Ser. No. 478,181, June 10, 1974, Pat. No. 3,965,552, which is a division of Ser. No. 274,668, July 24, 1972, abandoned, which is a continuation-in-part of Ser. No. 134,689, April 16, 1971, Pat. No. 3,679,950. This application Feb. 23, 1976, Ser. No. 660,522
The portion of the term of this patent subsequent to June 14, 1994, has been disclaimed.
Int. Cl.[2] H01G 1/14, 4/12
U.S. Cl. 361—309 10 Claims



1. A sintered, unitary, ceramic body comprising: a plurality of strata of a dense insulating or dielectric ceramic composition, a stratum of open-structured ceramic material between said strata and extending to an edge region of said body, and a penetrable barrier on said body over said region.

4,071,881

DIELECTRIC COMPOSITIONS OF MAGNESIUM TITANATE AND DEVICES THEREOF

Rudolph John Bacher, New Castle, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 30, 1976, Ser. No. 672,031
Int. Cl.[2] C04B *35/00*; H01G *4/20*
U.S. Cl. 361—320 **23 Claims**

1. Compositions of finely divided inorganic powders useful for forming dielectric layers in multilayer electronic structures of conductive and dielectric layers on an alumina substrate; those dielectric layers being capable of producing such multilayer structures having a dielectric constant below 10 and a dissipation factor of 0.6% or less, each at 1 kHz., and a quality factor above about 400 at 1 MHz.; the compositions consisting essentially of, by weight,

a. 65–90% of one or more non-conducting glasses having a softening point greater than 700° C. and a thermal expansion coefficient less than that of alumina, and the balance is

b. 10–35% of crystalline fillers which are, based on the total weight of the composition,

1. 0–25% $MgTiO_3$ and/or

2. 0–35% mixtures of precursor crystalline oxides MgO and TiO_2 capable of forming $MgTiO_3$

provided that where the weight of $MgTiO_3$ in these compositions is less than 10%, the relative proportions of precursor crystalline oxides (2) are such that in the fired dielectric layer(s) in the aforesaid multilayer electronic structure(s) there will be a total of at least 10% $MgTiO_3$, and further provided that the relative proportions of precursor crystalline oxides are such that in the fired dielectric layers there will be no more than 25% $MgTiO_3$.

17. In multilayer electronic structures comprising as sequential layers on a prefired alumina substrate a bottom electrode on an adherent to said substrate, a dielectric layer over and adherent to at least part of said bottom electrode, and a top electrode over and adherent to at least part of said dielectric layer, improved multilayer structures, capable of having a dielectric constant below 10 and a dissipation factor of 0.6% or less, each at 1 kHz., and a quality factor above about 400 at 1 MHz.; wherein said dielectric layer consists essentially of, by weight

a. 65–90% non-conducting glass having a softening point greater than 700° C. and a thermal expansion coefficient less than that of alumina, and the balance is

b. 10–35% of crystalline fillers which are, based on the total weight of the dielectric layer,

1. 10–25% $MgTiO_3$ and

2. 0–25% MgO or TiO_2.

4,071,882

STRUCTURE FOR ELECTRICAL INTERFACE

Robert Henry Rehder, Peterborough, Canada, assignor to Canadian General Electric Co., Ltd., Toronto, Canada

Filed Nov. 24, 1976, Ser. No. 744,893
Claims priority, application Canada, June 16, 1976, 254998
Int. Cl.[2] H02B *1/20, 5/00*; H02G *5/06, 7/00*
U.S. Cl. 361—333 **9 Claims**

1. An electrical interface device for interfacing at least one overhead electrical distribution line with electrical equipment, said interface device comprising:

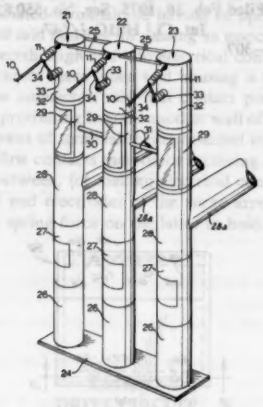
a. at least one generally-cylindrical vertical metal column adapted to be at ground potential,

b. means for supporting said column from its lower extremity in a position adjacent to electrical equipment, with the longitudinal axis of said column approximately vertical;

c. at least one generally vertically-extending conductor located inside said column and insulated therefrom,

d. means extending into said column adjacent the upper end of the column for electrically connecting an overhead distribution line to said conductor at the upper end of said conductor,

e. generally-horizontal conductive means projecting laterally from said conductor through said metal column at a location intermediate the ends of said column for electrically connecting said conductor to electrical equipment, and



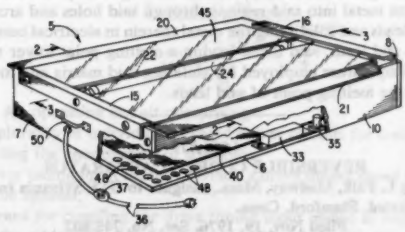
f. a generally horizontally-extending tubular metal enclosure located intermediate the ends of said vertical column and surrounding said horizontal conductive means immediately adjacent said vertical column.

4,071,883

MULTI-PURPOSE LABORATORY LIGHT BOX

Juanita Dennis, 1225 Derby St., Berkeley, Calif. 94702

Filed Sept. 28, 1976, Ser. No. 727,358
Int. Cl.[2] G09F *13/04*
U.S. Cl. 362—97 **8 Claims**



1. A multi-purpose laboratory light box, comprising:

a box having a bottom panel and side and end panels secured to each other in light-tight manner;

guide means on said end panels in spaced relation with said bottom panel;

a pair of top panels disposed in said guide means and adapted to be moved toward and away from each other to provide an opening therebetween of variable width and location;

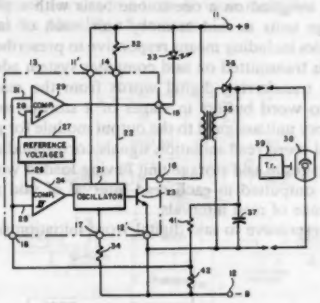
a pair of tubular fluorescent lamps respectively mounted within said box on the facing edge portions of said top panels, said lamps being adjacent to and substantially flush with the facing edges of said top panels, and

circuit means for energizing said lamps for observation and photography.

4,071,884
INTEGRATED CIRCUIT HIGH VOLTAGE DC CONVERTER

Robert J. Maigret, Warwick, R.I., assignor to Micro Components Corporation, Cranston, R.I.

Filed June 14, 1976, Ser. No. 695,636
Int. Cl.² H02P *13/22*
U.S. Cl. 363—21 **4 Claims**



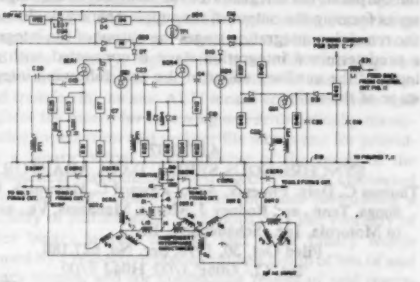
1. A high voltage DC converter comprising:
a low voltage DC supply;
a rectangular wave oscillator of constant duty cycle comprising a high current silicon transistor connected to said supply and controlled for oscillation or non-oscillation by the condition of a control signal applied thereto;
a two-winding high voltage step-up transformer matched to the duty cycle of said oscillator;
power amplifier means having an input circuit driven by said oscillator and an output circuit connected through the primary winding of said transformer to said supply;
a voltage comparator having switching hysteresis;
a reference voltage source derived from said supply;
means for applying a constant voltage derived from said reference voltage source and a voltage representative of the output voltage from the secondary winding of said transformer to control switching in said voltage comparator to selectively provide a high voltage condition or a low voltage condition at the output of said comparator in response to the relative magnitudes of said applied voltages, and
means for coupling the switching output of said comparator as said control signal to control on-off switching of said oscillator,
said oscillator and said power amplifier are switched to be inactive at substantially low current condition for the high voltage output condition of said comparator,
wherein said oscillator, said power amplifier, said reference voltage source and said comparator comprise a single chip silicon integrated circuit with an oscillator terminal and a power amplifier output terminal and including: frequency controlling circuit means connected to said oscillator terminal; and
a circuit connecting to said primary winding from one terminal of said DC supply to said output terminal.

4,071,885
ELECTRIC ARC WELDING POWER SUPPLY

Dale Louis Bilczo, Parma Heights; Kenneth Anthony Golonka, Richmond Heights; John Arthur Overman, Chagrin Falls, and John Ernest Carroll, Moreland Hills, all of Ohio, assignors to The Lincoln Electric Company, Cleveland, Ohio

Filed Dec. 5, 1975, Ser. No. 638,165
Int. Cl.² H02M *7/00*
U.S. Cl. 363—64 **35 Claims**

1. In an arc welding power source including: a three phase transformer having a pair of secondaries, each including three windings; a rectifier in series with each winding; the series rectifiers and windings of each secondary being connected in a wye configuration and arranged to have a pair of DC output terminals, said output terminals being connected in parallel and arranged to supply power to external terminals of said power

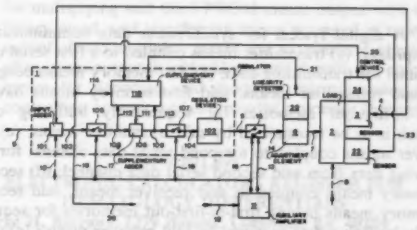


source, the improvement which comprises: independent inductances in series with each secondary and its output terminals, in combination with, said rectifiers having a gate responsive to an input signal to cause the rectifiers to conduct for selected portions of the AC cycle.

4,071,886
SELF-ADJUSTING REGULATION SYSTEM

Walter Eicher, Gockhausen, Switzerland, assignor to Contraves AG, Zurich, Switzerland

Filed Jan. 22, 1976, Ser. No. 651,578
Claims priority, application Switzerland, Feb. 6, 1975, 1467/75
Int. Cl.² G05B *11/36*
U.S. Cl. 364—118 **7 Claims**



1. A self-adjusting regulation system comprising a regulator incorporating an input adder for forming the difference of a feedback magnitude from a load and a command magnitude and for producing an error signal and a regulation device for forming an adjustment magnitude from said error signal, an adjustment element for limiting the value of the error signal received by the load, a linearity detector, said adjustment element controlling said linearity detector, said linearity detector delivering a control signal upon the presence of a non-linear behaviour of the regulation system, a supplementary adder arranged in the regulator between the input adder and the regulation device, said regulation device having an input, said supplementary adder having a first input, a second input and an output, said input adder having an output, the first input of the supplementary adder being connected with the output of the input adder, the output of the supplementary adder being connected with the input of the regulation device, a supplementary device having an output connected with the second input of the supplementary adder, said supplementary device comprising a number N of similar integration stages forming a series, each integration stage comprising an integrator having an input and an auxiliary adder having an output connected with the input of the integrator via a control switch responsive

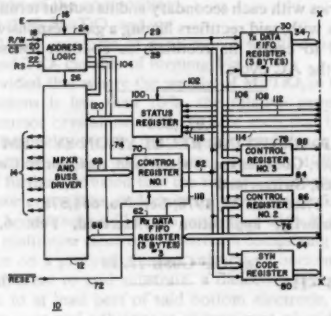
to the control signal, the auxiliary adder having a first input connected via a first multiplier with the first input of the supplementary adder and having a second input connected via a second multiplier with the output of the supplementary adder, the output of the integrator of the last integration stage of the series forming the output of the supplementary device, and for the remaining integration stages the output of the integrator of a predetermined integration stage is connected with a third input of the auxiliary adder of the next following integration stage of the series.

4,071,887

SYNCHRONOUS SERIAL DATA ADAPTOR

Thomas C. Daly, Phoenix, Ariz.; Edward C. Hepworth, Chattanooga, Tenn., and Rodney J. Means, Manassas, Va., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 30, 1975, Ser. No. 627,180
Int. Cl.[2] G06F *3/00*; H04J *3/00*
U.S. Cl. 364—200 **22 Claims**



1. A digital system for synchronous data communication comprising: (a) transmitter means coupled to a first serial data channel for transmitting data; (b) first memory means coupled to said transmitter means, said first memory means having first-in-first-out memories for sequentially buffering data which is to be transmitted by said transmitter means; (c) receiver means coupled to a second serial data channel for receiving data from said second serial data channel; (d) second memory means coupled to said receiver means, said second memory means having first-in-first-out memories for sequentially buffering data received by said receiver means; (e) control means coupled to said transmitter means and to said receiver means for selectively altering the structure of data transmitted on said first serial data channel and of data received on said second serial data channel and for synchronizing data received by said receiver means so as to insure the receipt of the beginning of a message; and (f) a bidirectional interface means coupled to an external bus and coupled to said first memory means, to said second memory means and to said control means for transferring data from said external bus to said first memory means and for transferring data to said external bus from said second memory means.

4,071,888

TELEPHONE MULTILINE AUTOMATIC VOICE ANSWER SYSTEM

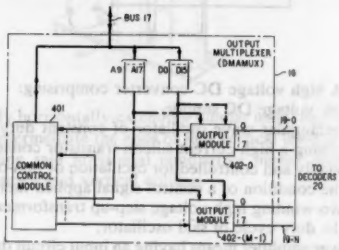
Gerald John Owens, Freehold Township, Monmouth County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 16, 1977, Ser. No. 769,166
Int. Cl.[2] G06F *3/04*
U.S. Cl. 364—200 **17 Claims**

1. In a multiline telephone inquiry voice answer system of the type including output apparatus for monitoring address lines in a computer system to detect when digital words to be outputted have been loaded from a mass storage unit into word buffers in storage stages of a memory unit separate from the mass storage unit and then generating control signals to initiate and effect reading of those digital words in a prescribed output sequence of read intervals, wherein the improvement comprises:

a plurality of output modules each adapted to supply digital words to a predetermined number of output lines and being assigned on a one-to-one basis with a plurality of storage units in said memory unit, each of said output modules including means responsive to prescribed address signals transmitted on said computer system address lines when transferring digital words from the mass storage unit to word buffers in stages of a storage unit of said memory unit assigned to the output module for generating digital word read initiation signals corresponding to storage stages in said storage unit having loaded word buffers to be outputted in each read interval of said prescribed sequence of read intervals;

means responsive to said digital word initiation signals supplied from said plurality of output modules during each of said read intervals for normally generating a prescribed sequence of read control signals in response to each of said read initiation signals for effecting reading in a prescribed priority sequence digital words from word buffers in storage stages of said storage units corresponding to said output modules generating read initiation signals in each of said read intervals; and



means in each of said output modules responsive to predetermined ones of said control signals in a corresponding sequence generated to effect reading of a digital word from a word buffer in a storage stage of a storage unit assigned to the output module in said priority sequence for enabling the corresponding output module to receive the corresponding digital word, wherein a number of digital words are read in said priority sequence during each read interval in said prescribed sequence of read intervals corresponding to the number of output modules generating said read initiation signals which number is variable from read interval to read interval dependent on the number of output modules that have generated read initiation signals.

4,071,889

CENTRAL PROCESSING APPARATUS FOR GENERATING AND RECEIVING TIME DIVISION MULTIPLEX SIGNALS

Shizuo Sumida; Kazuo Nii, both of Hiroshima; Osamu Shimizu, Himeji; Atsushi Ueda, Himeji, and Mitsuaki Ishii, Himeji, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

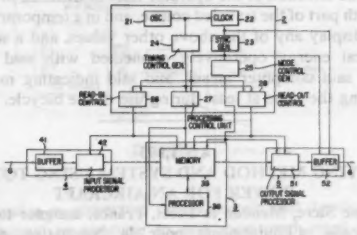
Continuation of Ser. No. 492,715, July 29, 1974, abandoned.
This application July 22, 1976, Ser. No. 707,512
Claims priority, application Japan, July 28, 1973, 48-85163
Int. Cl.[2] G06F *3/04*
U.S. Cl. 364—200 **3 Claims**

1. In a system including a plurality of remote electrical devices, and a multiplex signal transmission line coupled to

each of the plurality of devices, a central processing apparatus comprising:

input means coupled to the multiplex signal transmission line for receiving state signals from the plurality of devices in a time division multiplex format representing the states of the plurality of devices;

output means coupled to the multiplex signal transmission line for transmitting logically processed signals to the plurality of devices in a time division multiplex format to control the plurality of devices;



logic processing means coupled to the input means and responsive to the receiving of the state signals for generating the logically processed signals;

a memory coupled to the logic processing means, the input means, and the output means, for storing the state signals received from the plurality of devices and the logically processed signals generated by the logic processing means and for transferring the logically processed signals to the output means; and

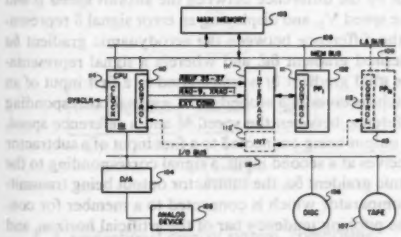
stored program control means coupled to the memory, the logic processing means, the input means, and the output means for controlling the operation thereof.

4,071,890

CPU-SYNCHRONOUS PARALLEL DATA PROCESSOR APPARATUS

Arun K. Pandeya, Framingham, Mass., assignor to Data General Corporation, Westboro, Mass.

Filed Nov. 29, 1976, Ser. No. 745,910
Int. Cl.[2] G06F 9/18, 9/16
U.S. Cl. 364—200 **8 Claims**



1. In an improved binary data processing system including a main memory for storing at least said data in the form of binary words of predetermined bit length; a CPU connected from said main memory for processing said data, said CPU including clock means for providing timing signals for the operation of said system and a system controller for controlling the operation of said system, said system controller including a microprogram control store having a plurality of pages of predetermined word length and CPU interface structure including a modified microprogram control store consisting of extension of said predetermined word length of at least one of said pages, said extension having stored therein a modified microprogram; and said system further including I/O bus means connected from said CPU to outside of said system for transferring said data therebetween, the improvement comprising:

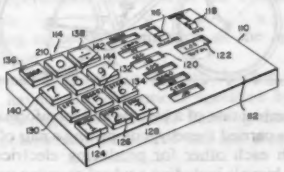
a parallel processor connected between said interface structure and said main memory for processing certain of said binary data simultaneously and synchronously with operation of said CPU, said parallel processor comprising: means for transferring said certain of said data to and from said main memory; register file means for receiving and temporarily storing at least said certain of said data from said transferring means; ALU means connected from said register file means for receiving and arithmetically manipulating inputs from said register file means and for providing a binary output representative of the result of the arithmetical manipulation; first PROM means connected from said ALU means for receiving and performing a plurality of mathematical operations on a like plurality of other binary words, each of said other binary words formed by a respective predetermined group of bits of said binary output, and for conducting results of said operations to said register file means; second PROM means for receiving and performing a second mathematical operation on another predetermined group of bits of said binary output; M0 register means for receiving and temporarily storing said certain of said data from said transferring means; means for combining the outputs of said second PROM means and said M0 register means into a binary address and for addressing said main memory with said address; third PROM means for receiving and performing a third mathematical operation on said another predetermined group of bits; other register means for receiving and temporarily storing output of said third PROM means and for receiving from said transferring means and temporarily storing said binary words of predetermined bit length; said addressing means permitting said main memory to read out to said transferring means, said binary word of predetermined bit length located at said address; multiplier means connected from said other register means for multiplying said third PROM means output with said binary word, said transferring means arranged to receive output of said multiplier means and to transfer said multiplier means output to said address; and decode and control means for decoding said modified microprogram and controlling operation of said parallel processor therewith.

4,071,891

ELECTRONIC CALCULATOR - REGISTER FOR HEMATOLOGY DIFFERENTIALS

George H. Barrows, 1279 Bassett, Louisville, Ky. 40204

Filed Apr. 30, 1976, Ser. No. 682,149
Int. Cl.[2] G06F 15/42; G01N 33/16
U.S. Cl. 364—416 **8 Claims**



1. An electronic calculator-register for hematology differentials comprising:

A. a plurality of counter-calculator means for storing numbers entered therein and performing mathematical computations on said entered numbers in response to instructional commands entered therein,

B. dual purpose keyboard means coded for the first purpose of visibly detecting specific types of blood cells and manually entering said cells in a one-by-one fashion and including a plurality of input elements coded for the second

purpose of introducing numerical data and instructional commands in response to the operation of said input elements,

C. switching network means operatively connected said keyboard entry means and said plurality of counter-calculator means for entering into said counter-calculator means said data and instructional commands introduced by said keyboard means,

D. said switching network means including first means for operatively connecting each of a first selected plurality of said input elements to different ones of a selected plurality of said counter-calculator means, and for entering an interger 1 corresponding to the specific blood cell type visibly detected in one of said counter-calculator means and instructing one of said counter-calculator means to add the entered integer 1 to the numbers stored therein and to store the resultant sum of detected blood cells when the respective said input element is operated,

E. said switching network means including second means for operatively connecting said first selected plurality of input elements to another of said counter-calculator means and for entering an interger 1 in said counter-calculator means and instructing said last mentioned counter-calculator to add the entered integer 1 to the number stored therein and to store the resultant sum when any of said first selected plurality of input elements is operated,

F. said switching network means including third means for operatively connecting each of a second plurality of input elements to each of said first selected plurality of counter-calculator means and for entering a number and instructional commands therein causing each of said counter-calculator means to effectively divide the resultant sum previously stored therein by the second number and store resultant quotient, and

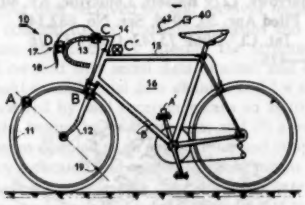
G. display means associated with each of said counter-calculator means for displaying numbers currently stored therein.

4,071,892

BICYCLE AND INFORMATION-PRODUCING ASSEMBLY CARRIED THEREBY

Claude Genzling, 15 Avenue des Cedres, 92410 Ville d'Avray, France

Filed Apr. 20, 1976, Ser. No. 678,488
Claims priority, application France, Apr. 21, 1975, 75 12337
Int. Cl.[2] G01P *3/42;* **G06F** *15/02*
U.S. Cl. 364—424 **11 Claims**



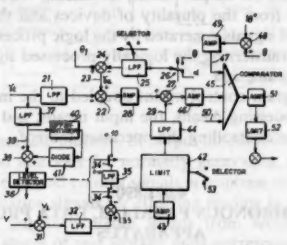
1. The combination of a bicycle and an information-producing assembly carried thereby, comprising a pair of means cooperating with each other for producing electrical revolution signals, said bicycle including a wheel carrying one of said pair of means for rotation with said wheel and a part carrying the other of said pair of means at a location for responding to turning of said one of said pair of means past the other of said pair of means for providing a revolution signal at each revolution of said wheel which carries said one of said pair of means, computer means carried by another part of the bicycle and electrically connected with the other of said pair of means for receiving said revolution signals therefrom, timed signal-producing means for producing timed electrical signals at a given frequency, said timed signal-producing means being electrically connected with said computer means for transmitting said timed signals thereto, said computer means having logic and arithmetic circuits for carrying out operations such as conditioning, calculating, treating, and memorizing, to produce from said revolution signals and timed signals a lasting value of distance traveled and ultimately of time elapsed during travel of the bicycle along a given course, and for also producing at the option of the operator values in connection with part of a course which is traveled by the bicycle, such as distance or time, average speed, maximum speed, and instantaneous speed attained at any given instant, indicating means operatively connected with said computer means for indicating at the selection of the operator time or distance in connection with part of the traveled course, and in a temporary illuminated display any of the above other values, and a source of electrical energy operatively connected with said pair of means, said computer means, and said indicating means for operating the same at least during use of the bicycle.

4,071,893

FLYING METHOD AND SYSTEM USING TOTAL POWER FOR AN AIRCRAFT

Jean-Luc Sicre, Meudon la Foret, France, assignor to Societe Francaise d'Equipements pour la Navigation Aerienne, Velizy-Villacoublay, France

Filed July 6, 1976, Ser. No. 703,006
Int. Cl.[2] G06G *7/78;* **B64C** *13/50*
U.S. Cl. 364—427 **22 Claims**



12. A system for applying a flying method using total power, for an aircraft, and comprising the steps of governing the aerodynamic gradient δa by reference to a desired gradient δd, obtaining the desired gradient δd by modulating the total gradient δt by the difference between the aircraft speed B and a reference speed V_2, and displaying an error signal δ representative of the difference between the aerodynamic gradient δa and the desired gradient δd, and wherein a signal representative of the total gradient δt is transmitted to a first input of an adder which receives at a second input a signal corresponding to the difference between the speed V and a reference speed, the adder output being connected to a first input of a subtractor which receives at a second input, a signal corresponding to the aerodynamic graident δa, the subtractor output being transmitted to a comparator which is connected to a member for controlling the pitching tendency bar of the artificial horizon, and the comparator also receiving a signal representative of a variation of stable position and a reference signal.

4,071,894

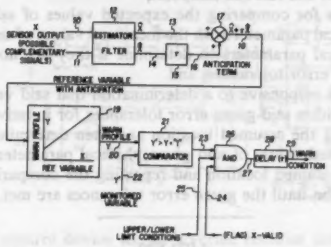
PROFILE WARNING GENERATOR WITH ANTICIPATION OF WARNING CONDITION

Theodore J. Schuldt, Thousand Oaks, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed June 28, 1976, Ser. No. 700,634
Int. Cl.[2] G06F *15/50;* **G08G** *5/00*
U.S. Cl. 364—430 **6 Claims**

1. A system for generating an output warning condition signal when a monitored input variable exceeds a reference profile value defined by a predetermined function of an input

reference variable, comprising, signal generation means receiving said reference variable as input thereto and developing from the instant value and rate of change thereof a calculated future value of said reference variable after a time interval τ, said calculated future value being applied to a profile generating means to output said reference profile, comparator means receiving said monitored input variable and said reference



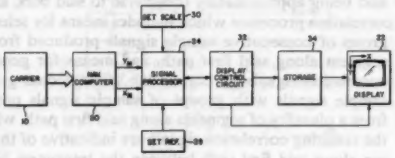
profile value as respective inputs thereto and developing an output signal in response to said monitored input variable exceeding said reference profile value, signal delay means receiving the output from said comparator means and imparting thereto a delay equated to said time interval τ, and the output of said delay means comprising said output warning condition signal.

4,071,895

NAVIGATIONAL DISPLAY SYSTEM

Kenneth E. Wood, and James T. O'Farrell, both of Annapolis, Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 10, 1976, Ser. No. 713,179
Int. Cl.² G01S 7/04
U.S. Cl. 364—449 **12 Claims**



1. A navigational display system, comprising:

A. a TV monitor;

B. means for providing first and second coordinate navigation signals indicative of the position of said carrier relative to a navigational reference;

C. means for converting said first navigation signal into a calculated scaled quantity between zero and L, where L is the number of active TV lines to be displayed on the monitor's TV picture;

D. means for converting said second navigation signal into a calculated scaled quantity across a TV line; and

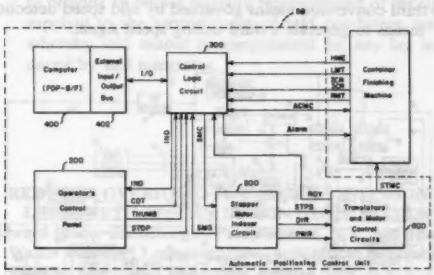
E. means for displaying a mark in said TV picture at the appropriately calculated TV line and distance along that line.

4,071,896

NUMERICAL CONTROL SYSTEM FOR FINISHING MACHINES

David Harrison Boyer, III, Baltimore, and Richard Dale Mitchell, Fallston, both of Md., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Filed Dec. 17, 1976, Ser. No. 751,895
Int. Cl.² B31B 3/14
U.S. Cl. 364—471 **19 Claims**



1. A method for producing corrugated paperboard containers of a desired size wherein the container blanks are processed by a container finishing machine having appurtenances which perform feeding, cutting, crushing, printing, folding and joining operations on the container blank, each of the appurtenances having an electrical drive motor connected thereto for individually positioning the appurtenances, the machine having multiple sections relatively movable into closed and open positions, the method comprising the steps of:

a. initially positioning the appurtenances at known positions with the drive motors;

b. supplying to a digital computing means, digital signals specifying dimensions of the container blank and locations on the container blank of operation to be performed on the container blank by each appurtenance for a container of the desired size and shape;

c. generating in response to the digital signals, electrical signals each representing a distance and direction of movement required to position an appurtenance relative to the known position of that appurtanance so as to perform a desired operation on the container blank at the location specified by the digital signals;

d. sensing an operational condition of the container finishing machine including the open and closed conditions of the sections of the container finishing machine;

e. applying the generated electrical signals to the drive motors of the appurtenances in accordance with a predetermined application sequence in response to a sensed closed operational condition of the container finishing machine;

f. indicating successful completion of the application sequence; and

g. subsequent to the indicating step, feeding the container blanks having the dimensions specified by the digital signals through the container finishing machine to produce containers of the desired size and shape.

4,071,897

POWER PLANT SPEED CHANNEL SELECTION SYSTEM

Charles L. Groves, Jr., Willingboro, N.J., and Steven J. Johnson, McCandless Township, Allegheny County, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 10, 1976, Ser. No. 713,176
Int. Cl.² F01K 13/02; H02P 9/04
U.S. Cl. 364—494 **17 Claims**

1. A system for controlling the operation of a turbine power

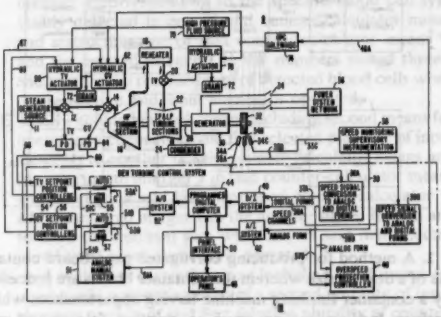
plant in accordance with monitored speed, said system comprising:

speed detection means;

a first conversion means governed by said detection means to generate both a first digital speed signal and a first analog speed signal;

a second conversion means similar to said first conversion means governed by said speed detection means to generate both a second digital speed signal and a second analog speed signal;

a third conversion means governed by said speed detection means to generate a third analog speed signal;



a first turbine controller governed by said first and second digital speed signals and said third analog speed signal to control the operation of the turbine below a predetermined speed level in accordance with a selected one of said first and second digital speed signals; and

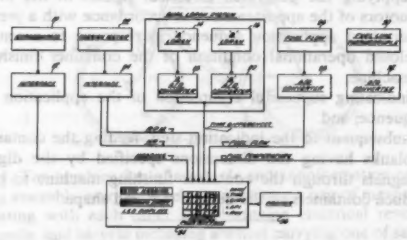
a second turbine controller governed by said first, second and third analog speed signals to control the operation of the turbine above a predetermined speed level in accordance with a selected one of said first and second analog speed signals.

4,071,898

SHIP PERFORMANCE ANALYZER

Eugene Schorsch, Springfield, Pa., and Spurgen Sutherland, Clifton, N.J., assignors to Sun Shipbuilding & Dry Dock Company, Chester, Pa.

Filed June 14, 1976, Ser. No. 696,103
Int. Cl.² G01L *25/00*; G01S *5/02*
U.S. Cl. 364—551 **12 Claims**



1. In a system for enabling the performance of a ship on a test run to be analyzed and including a means for determining the speed of the ship propeller shaft, a means for determining the rotational torque on the ship propeller shaft, and means for receiving successive readings in time of Loran navigational signals, the improvement comprising means responsive to the successive readings in time of the received Loran navigational signals for determining the ship speed regardless of whether or not the ship is traveling substantially perpendicular to Loran lines of hyperbolae, said means for determining the ship speed including:

a. means for storing expected values of a given physical parameter which is dependent upon Loran time difference readings at an assumed geographical location of the test run midpoint;

b. means, responsive to the successive readings in time, for calculating measured values of said given physical parameter for the test run midpoint;

c. means for comparing the expected values of said given physical parameter with the measured values of said given physical parameters to determine if they are not within given error tolerances; and

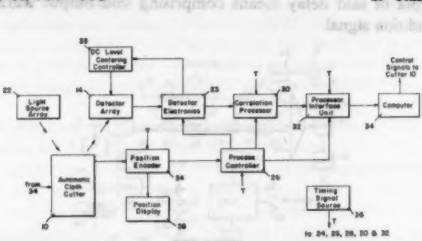
d. means responsive to a determination that said values are not within said given error tolerances for iteratively correcting the assumed location and then determining new expected values of said given physical parameter for the next assumed location and repeating the comparison and iteration until the given error tolerances are met.

4,071,899

SYSTEM AND METHOD FOR THE MEASUREMENT OF REPETITIVE PATTERNS

Josef K. Holy, Carlsbad, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed July 9, 1976, Ser. No. 704,191
Int. Cl.² G01N *21/32*; G06F *15/34, 15/46*
U.S. Cl. 364—561 **19 Claims**



1. A system for providing signals which are indicative of the spacing between repetitive transverse bar patterns of a plaid material, said system comprising:

sampling means for providing sample signals which are indicative of the relative light reflectivity of said material at given increments along a first path which is substantially parallel to one dimension thereof, said one dimension being approximately transverse to said bars; and

a correlation processor which includes means for selecting a group of consecutive sample signals produced from one segment along said first path, and means for generating correlation signals by correlating said selected group of sample signals with groups of sample signals produced from a plurality of segments along said first path, whereby the resulting correlation signals are indicative of the spacing along said first path between the transverse bar patterns.

19. A method for providing signals which are indicative of the spacing between repetitive transverse bar patterns of a plaid material, said method comprising the steps of:

sampling the relative light reflectivity of said material at given increments along a first path which is substantially parallel to one dimension thereof, said one dimension being approximately transverse to said bars;

selecting a group of consecutive sample signals produced from one segment along said first path, and

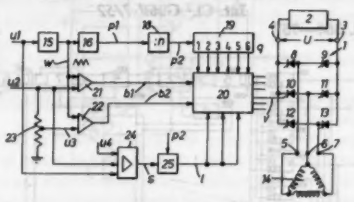
generating correlation signals by correlating the selected group of sample signals with groups of sample signals produced from a plurality of segments along said first path, whereby the resulting correlation function signals are indicative of the spacing between the transverse bar patterns.

4,071,900

CONTROL DEVICE FOR AN INVERTED RECTIFIER

Arne Jensen, Sonderborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Dec. 1, 1976, Ser. No. 746,389
Claims priority, application Germany, Dec. 3, 1975, 2554223
Int. Cl.² G06J *1/00*; H02P *5/16*
U.S. Cl. 364—600 5 Claims



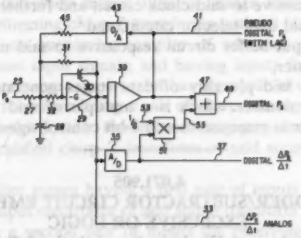
1. A control device for an inverted rectifier unit having a plurality of switches, comprising a logic unit having a plurality of outputs connected respectively to said rectifier switches, oscillator means having a frequency determined by a first control signal, commutator means between said oscillator and said logic unit for inputting a corresponding plurality of unmodulated zone signals to said logic unit, comparator means connected to said oscillator and controlled by a second control signal for supplying a pulse train to said logic unit having a frequency set by said first signal and spacing determined jointly by said first and second signals, analog computer means for generating a function which corresponds to said pulse train spacing, said computer having a first input for receiving a third signal for adjustably setting a critical spacing corresponding to the amplitude of the output of said oscillator means, said computer having second and third inputs for receiving respectively said first and second control signals for comparison with said third signal.

4,071,901

ANALOG-TO-DIGITAL CONVERSION MEANS AND ASSOCIATED LAG COMPENSATED APPARATUS

James L. Brown, Toddville, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 8, 1976, Ser. No. 739,891
Int. Cl.² G06J *1/00*; H03K *13/02*
U.S. Cl. 364—605 4 Claims



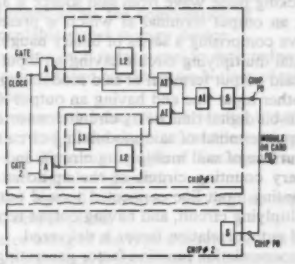
1. Differentiating apparatus comprising:
an amplifier having a gain of G and having an input and an output;
signal combining means, including first and second inputs, connected to supply output signals to the input of said amplifier;
feedback means connected between the output of said amplifier and the first input of said signal combining means, and comprising, in series, an analog-to-digital integrator, and a digital-to-analog converter;
means for supplying an analog signal to be converted to the second input of said signal combining means;
an analog-to-digital converter connected to the output of said amplifier for providing a digital signal output representative of the rate of change of the signal supplied to the second input of said signal combining means;
means connected to receive digital signals from said analog-to-digital converter for providing an output signal indicative of 1/G times the received signal;
and algebraic combining means, connected to receive the output of said integrator and from said means providing an output signal indicative of 1/G times the received signal to provide an output digitally representative of the signal supplied to the second input of said combining means, whereby said output is compensated for any lag introduced by said integrator.

4,071,902

REDUCED OVERHEAD FOR CLOCK TESTING IN A LEVEL SYSTEM SCAN DESIGN (LSSD) SYSTEM

Edward Baxter Eichelberger, Purdy Station, N.Y., and Thomas Walter Williams, Longmont, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1976, Ser. No. 701,053
Int. Cl.² G06F *7/38*
U.S. Cl. 364—716 14 Claims



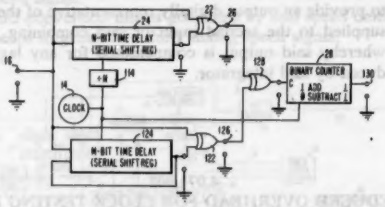
1. A functional logic unit comprising:
a plurality of latches arranged in groups;
means for generating a plurality of clock signal trains coupled to respective groups of said latches for controlling the latches;
plural networks at least one of which is responsive to a set of unit input signals with each such network providing a set of network signal indications;
means coupling the sets of network signal indications to respective groups of latches such that the indications are latched in the respective groups under the control of the respective clock signal trains;
means coupling the outputs of the respective groups of latches as sets of inputs to all networks except a network coupled to a latch group controlled by the same clock signal train;
means coupling the outputs of the latch groups for providing a logic unit output indication that is a function of said set of unit input signals and said indications in the respective groups of latches;
further means interconnecting said plurality of latches arranged in groups into at least one shift register having a plurality of shift register stages, each of said stages of said shift register comprising a first latch and a second latch; and
additional circuit means including AND circuit means connected to at least certain of said second latches for test purposes, whereby at least certain of said first and second latches are employed to perform a logical function in said functional logic unit and a test function in testing said unit.

4,071,903

AUTOCORRELATION FUNCTION FACTOR GENERATING METHOD AND CIRCUITRY THEREFOR

Stanley Maurice Head, and Constantine Michael Melas, both of Los Gatos, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 4, 1976, Ser. No. 711,760
Int. Cl.[2] G06F *15/34*
U.S. Cl. 364—728 **6 Claims**



1. Autocorrelation function factor generating circuitry comprising;

a source of clocking pulse wave,

a signal modulating circuit arrangement having a modulating electric wave input terminal at which is applied a signal wave for which an autocorrelation function factor is desired, having a carrier wave input terminal at which a clocking pulse wave from said source is applied and having an output terminal at which is presented an output wave comprising a series of binary naughts and units,

a digital multiplying circuit having an input line connected to said output terminal of said modulating circuit, having another input line and having an output line,

a multi-bit digital time delay circuit connected between said output terminal of said modulating circuit and said other input line of said multiplying circuit, and

a binary counting circuit of the up-down type having a counting input line connected to said output line of said multiplying circuit, and having output terminals at which said autocorrelation factor is delivered.

5. Autocorrelation function factor generating circuitry comprising

a source of digital data signal represented by a stream of bivalued data bits,

modulated signal wave input terminals connected to said source,

output terminals at which an electric representation of a binary number autocorrelation function factor is delivered,

an XOR gating circuit having an input line connected to said input terminals, having another input line and having an output line,

a multi-bit digital time delay circuit connected between said input terminals and said other input line of said XOR gating circuit,

another XOR gating circuit having an input line connected to said input terminals, having another input line and having an output line,

another multi-bit digital time delay circuit connected between said output terminals and said other input line of said other XOR gating circuit, and connected for recirculating operation,

a source of timing waves connected to said digital time delay circuits for recirculating the data in said other time delay circuit in synchronism and as fast as the passage of one bit in the first said time delay circuit,

a further XOR gating circuit having input lines individually connected to said output lines of the other XOR gating circuit, and

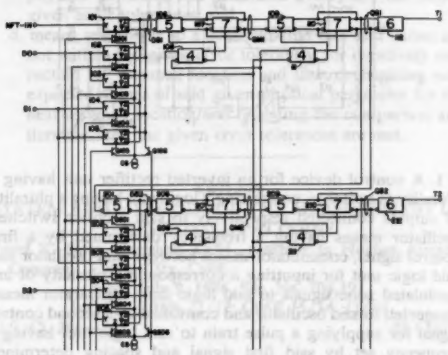
a binary counting circuit of the type wherein one binary unit is added in response to each input binary unit and one binary unit is subtracted in response to each input binary naught and having a counting input line connected to said output line of said further XOR gating circuit, and having output terminals connected to said factor delivering output terminals.

4,071,904

CURRENT MODE MULTIPLE-GENERATING REGISTER

Homer Warner Miller, Peoria, Ariz., assignor to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Jan. 3, 1977, Ser. No. 756,465
Int. Cl.[2] G06F *7/52*
U.S. Cl. 364—757 **6 Claims**



1. An improved current mode muliple-generating register for generating multiples of a first binary number which is input thereto, said register being provided with non-functional test (NFT) capabilities, said register comprising:

a control circuit comprising a first portion responsive to a 3-bit control signal Y1 Y2 Y4 and a second portion responsive to a first control signal NFTR and to a second control signal NFTS;

a clock circuit responsive to a clock signal $ and to a clock-enable signal ¢S;

a plurality of data stages, each of which is responsive to a respective bit of said first binary number, each of said data stages further comprising

a data selector circuit responsive to said respective bit of said first binary number and further responsive to said control circuit,

a master/slave register, said master/slave register being responsive to said clock circuit and further responsive to said data selector circuit, and

an output buffer circuit responsive to said master/slave register,

whereby said plurality of data stages generate a second binary number which is a multiple of said first binary number in response to said 3-bit control signal.

4,071,905

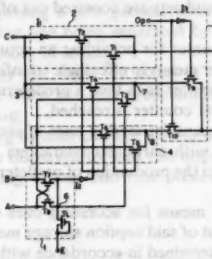
FULL ADDER/SUBTRACTOR CIRCUIT EMPLOYING EXCLUSIVE OR LOGIC

Tetsuji Oguchi, and Hirokazu Kawai, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Oct. 27, 1976, Ser. No. 736,236
Claims priority, application Japan, Oct. 31, 1975, 50-130534
Int. Cl.[2] G06F *7/50*
U.S. Cl. 364—784 **9 Claims**

1. A circuit comprising an exclusive logic sum termn generator generating an exclusive logic sum term of a first and second operand signals, a result signal generator receiving a third signal representing one of carry and borrow information and deriving a result signal from one of said third signal and an inverted signal thereof in response to the output of said exclusive logic sum term generator, a carry and borrow signal generator deriving one of said third signal and said first oper-

and signal as a carry signal and the other of said third signal and said first operand signal as a borrow signal both in response to said output of said exclusive logic sum term genera-



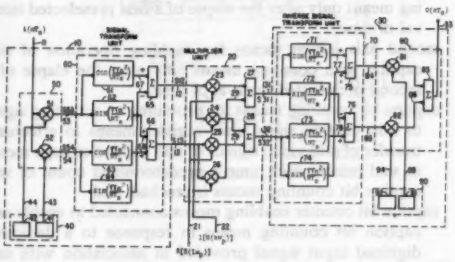
tor, and a selection circuit selecting one of said carry signal and said borrow signal in response to a command signal commanding one of addition and subtraction.

4,071,906

CTD PROGRAMMABLE CONVOLVER

Dennis D. Buss, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 1, 1976, Ser. No. 728,702
Int. Cl.[2] G06G *7/19*; G11C *11/40*
U.S. Cl. 364—819 **45 Claims**



1. A programmable convolver comprising:

a. signal transform means utilizing charge transfer devices for performing chirp Z transforms without post multiplication, on successive samples of selected segments of electronic input signals; and having inputs for receiving said successive samples, and having a pair of output electrodes for transmitting a pair of electronic signals having magnitudes equal to the real and imaginary components of said modified chirp Z transform of said successive samples,

b. multiplier means having a first pair of inputs coupled to said output electrodes of said signal transform means, and having a second pair of inputs for receiving electronic signals having magnitudes equal to the real and imaginary components of an artibrary complex signal $H(kw_\rho)$; for producing a pair of product signals, on a pair of output electrodes, having magnitudes equal to the real and imaginary components of the complex product of the signals on said first and second pair of input electrodes, and

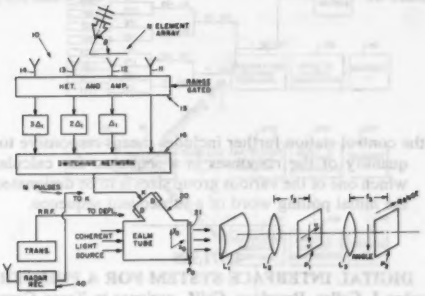
c. inverse signal transform means having inputs coupled to said output electrodes of said multiplier means; and utilizing charge transfer devices to perform inverse chirp Z transforms without pre-multiplication on said pair of product signals; and having output electrodes for transmitting electronic signals with magnitudes equal to said modified inverse chirp Z transform of said product signals.

4,071,907

RADAR SIGNAL PROCESSOR UTILIZING A MULTI-CHANNEL OPTICAL CORRELATOR

David Paul Casasent, Pittsburgh, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 12, 1976, Ser. No. 731,471
Int. Cl.[2] G06G *9/00*; G01S *7/16*
U.S. Cl. 364—822 **16 Claims**



1. In an electro-optic signal processor for providing target range and azimuth data from radar signals detected by an N element linear phased array, the combination of

an optically readable signal storage device;

means for recording each radar signal so detected as a corresponding transmittance condition on N lines of said signal storage device,

each signal recording being at a horizontal location such that the vertical phase slope across these recordings is indicative of the azimuth angle of the target from which the detected signal originated;

a multi-channel optical correlator having an input, frequency and output plane,

said correlator being of the type wherein the 1-D horizontal Fourier transform is performed between its input and frequency planes and a 2-D Fourier transform between its frequency and output planes;

a multi-channel 1-D matched spatial filter having target azimuth and range reference data stored therein in the form of an interference pattern,

said signal storage device being arranged such that the pattern of transmittance conditions representing the detected radar signal appears at the input plane of said correlator,

said matched filter being positioned such that the interference pattern stored therein appears at the frequency plane of said correlator; and

means for illuminating said input plane with a coherent light beam whereby the correlation peak appearing in the output plane of said correlator has coordinates that are proportional to the range and azimuth angle of said target.

4,071,908

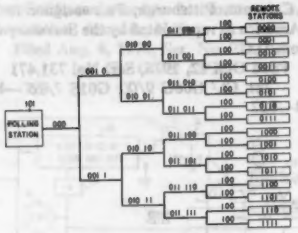
ADAPTIVE POLLING TECHNIQUE

Francis Joseph Brophy, East Windsor, and Jeremiah Francis Hayes, Tinton Falls, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, MurrayHill, N.J.

Filed Mar. 17, 1977, Ser. No. 778,352
Int. Cl.[2] G06F *3/04*; H04Q *5/00*
U.S. Cl. 364—900 **13 Claims**

1. A polling system including a control station and a plurality of remote stations, the control station including means for transmitting a sequence of polling words to query the remote stations, polling words designating remote station groups of various sizes and means responsive to responses to the group polling words for sending subsequent polling words in the sequence which designate successively smaller group sizes

until individual stations respond, CHARACTERIZED IN THAT



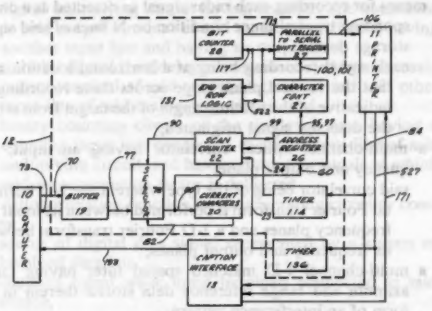
the control station further includes means responsive to the quantity of the responses in a sequence for calculating which one of the various group sizes is to be designated by the initial polling word of a subsequent sequence.

4,071,909

DIGITAL INTERFACE SYSTEM FOR A PRINTER

Stephen I. Geller, Pasadena, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 30, 1976, Ser. No. 728,084
Int. Cl.[2] G06F *3/12*
U.S. Cl. 364—900 **5 Claims**



1. Interface apparatus for use in adapting digitized bits of encoded character representations of message information from a computer to a form suitable for use with a printer that employs a cursor to scan in a raster parallel to a first axis and to move relative to a second axis perpendicular to said first axis to subsequent scans to effect permanent recordation of print characters utilizing a predetermined plurality of scans parallel to said first axis to produce each character on laminar record media comprising:

buffer storage means for receiving the digitized bits of encoded character representations,

current character storage means for retaining bit representations of a plurality of the digitized bits of encoded character representation next to be printed,

memory storage means for storing sets of video signals associated with particular characters in a character font and with particular scans in the aforesaid plurality of scans,

scan counting means that is incremented and reset in response to separate actuating signals from said printer and which provides a current scan count and also provides an advance signal to update the contents of said current character storage means each time a predetermined count is reached,

address means connected to said memory storage means and to said scan counting means and sequentially responsive to the bit representations of the plurality of the digitized bits of encoded character representation currently being processed and to the current scan count to sequentially access sets of video signals from said memory storage means,

shift register means connected to said memory storage means for sequentially passing sets of said video signals to said printer as said sets are accessed out of memory storage means,

a recycling bit counter for providing an actuating signal to said shift register means to effectuate transfer of said video signals to said printer each time a predetermined count of said recycling bit counter is reached,

caption storage means for storing ones of sets of video signals associated with particular characters in a character font dedicated to the production of predetermined caption information,

caption accessing means for accessing ones of said sets of video signals out of said caption storage means in a preselected order determined in accordance with the character sequence required by said predetermined caption information,

caption signal shift register means for receiving each set of video signals from said caption storage means with the signals in each set in a predetermined arrangement therein, and for sequentially passing said sets of video signals of said caption storage means to said printer as they are accessed out of caption storage means,

caption scan counting means incremented in response to a signal from said printer and operative in association with said accessing means to provide a current scan count to sequentially gate portions of said caption storage means, to allow accessing of video signals therefrom,

first axis inhibit means for enabling operation of said accessing means only after the elapse of a first preselected interval of time,

second axis inhibit means for enabling operation of said caption scan counting means only after the elapse of a second preselected interval of time,

caption bit counting means for providing an actuating signal to said caption signal shift register means to effectuate transfer of said video signals of said caption storage means to said printer each time a predetermined count of said caption bit counting means is reached, and

caption bit counter enabling means connected to enable said caption bit counting means in response to a dedicated digitized input signal provided in association with said digitized message information.

4,071,910

TIME-MULTIPLEXED OUTPUT DEVICES IN VIDEO TERMINAL SYSTEMS

Thomas C. Stockebrand, Albuquerque, N. Mex.; Russell C. Doane, Framingham, and Michael D. Morganstern, Wayland, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 516,348, Oct. 21, 1974. This application Nov. 8, 1976, Ser. No. 739,670
Int. Cl.[2] G06F *3/12, 3/14;* G06K *15/00*
U.S. Cl. 364—900 **5 Claims**

1. In a video terminal system having at least two display devices, one of said display devices displaying data at a rate approximately two orders of magnitude faster than the other display device, said video terminal system having a microprocessor executing instructions controlling transfers in said system, the process of providing data to each of said display devices comprising the steps of:

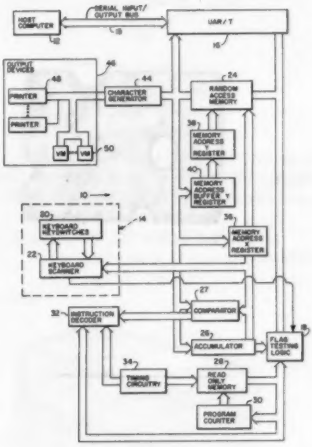
A. Storing, in a first part of memory, data to be displayed on said one display device;

B. counting in an accumulator the scans across said one display device, each display line on said one display device comprising a first predetermined number of scans, each display line being separated by a second predetermined number of scans;

C. sensing by test logic the count in said accumulator to determine when said first predetermined number of scans is occurring;

D. addressing by address logic said first part of memory for data to be displayed by said one display device;

E. transferring during said first predetermined number of



scans from said first part of memory through a character generator to said one display device a dot pattern of said addressed data;

E. displaying on said one display device said dot pattern for a display line during said first predetermined number of scans;

G. identifying by a key switch on a keyboard one of said display lines to be displayed on said other display device;

H. storing, in a second part of memory, address information which identifies data in said first part of memory to be displayed by said other display device;

I. addressing by said address information during said second predetermined number of scans said first part of memory for data to be displayed by said other display device;

J. transferring during said second predetermined number of scans said addressed data from said first part of memory through said character generator to said other display device a dot pattern of said addressed data;

K. repeating steps H through J until said display line of data has been displayed on said other display device; and

L. terminating steps H through K when said selected line has been displayed by said other display device.

4,071,911

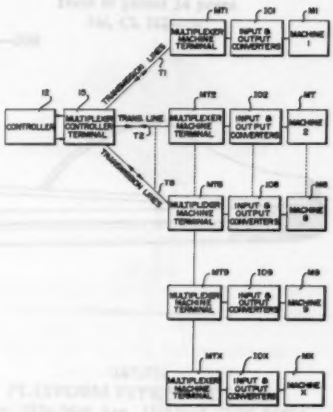
MACHINE CONTROL SYSTEM WITH MACHINE SERIALIZING AND SAFETY CIRCUITS

Richard A. Mazur, Downers Grove, Ill., assignor to Continental Can Co. Inc., New York, N.Y.

Continuation-in-part of Ser. No. 570,405, April 22, 1975, abandoned, and Ser. No. 570,406, April 22, 1975, abandoned. This application Apr. 9, 1976, Ser. No. 675,692

Int. Cl.[2] G06F *15/46, 15/06, 9/06, 11/00*

U.S. Cl. 364—900 **18 Claims**



1. A multiplexing machine control communications system for controlling a plurality of machines from a programmable controller, comprising

a multiplexer controller terminal for receiving condition-defining information signals representing the operational functions of a plurality of independently operable multifunctioning machines and transmitting predetermined command signals to control selected functions of each of said machines,

a programmable controller coupled to said multiplexer controller terminal to provide a source of said predetermined command signals for controlling said machines in response to said condition-defining information signals,

a plurality of multiplexer machine terminals, one coupled to each one of said plurality of independently operable multifunctioning machines to transmit condition-defining information signals responsive to the operational functions of a machine coupled thereto and to receive in response thereto selected ones of said predetermined command signals,

an input and output converter coupled between said multiplexer machine terminal and a machine coupled thereto for coupling said information and command signals therbetween,

respective transmission lines for connecting said multiplexer controller terminal in parallel with each of said multiplexer machine terminals,

said multiplexer machine terminals operating independently of each other for communication between said multiplexer controller terminal and each of said multiplexer machine terminals, and

safety circuit means for monitoring the transmission of data on said transmission lines and providing inhibit signals for inhibiting data transfer within the system when transmission on said lines is interrupted.

DESIGNS

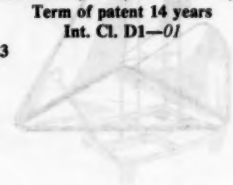
JANUARY 31, 1978

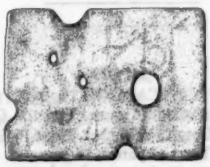
247,071
CRACKER

Jay R. Neidenberg, Randolph; Dewey L. Warren, Hewitt; Eugene D. Oppedisano, Glen Rock, and Robert R. Thulin, Franklin Lakes, all of N.J., assignors to Nabisco, Inc., East Hanover, N.J.

Filed June 2, 1976, Ser. No. 692,202
Term of patent 14 years
Int. Cl. D1—*01*

U.S. Cl. D1—23





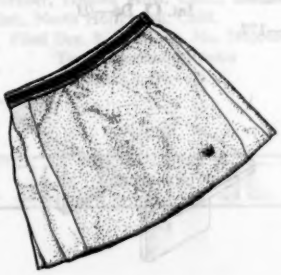
247,072
SKIRT

Peter William Swift Morgan, Keighley, England, assignor to Dunlop Limited, England

Filed Feb. 12, 1976, Ser. No. 657,482
Claims priority, application United Kingdom, Aug. 13, 1975, 972176

Term of patent 14 years
Int. Cl. D2—*02*

U.S. Cl. D2—224

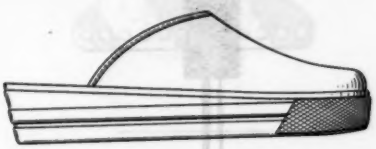


247,073
SHOE

William F. Kane, and Melvin R. Richardson, both of Costa Mesa, Calif., assignors to SneakSlides of California, Costa Mesa, Calif.

Filed May 19, 1976, Ser. No. 687,699
Term of patent 14 years
Int. Cl. D2—*04*

U.S. Cl. D2—308

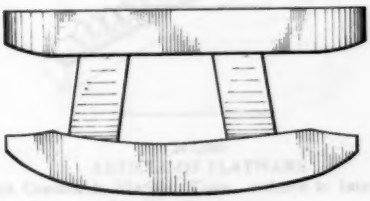


247,074
PLATFORM TYPE SHOE SOLE

George Henry, 1824-96th Ave., Oakland, Calif. 94603

Filed Aug. 25, 1975, Ser. No. 607,135
Term of patent 7 years
Int. Cl. D2—*04*

U.S. Cl. D2—322



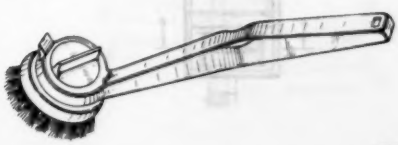
247,075
COMBINED CLEANING IMPLEMENT HANDLE AND INTERCHANGEABLE HEADS THEREFOR

Kurt Krusche, Nanserning 22, Frankfurt am Main, Germany (6000)

Filed Nov. 6, 1975, Ser. No. 629,306
Claims priority, application Germany, May 9, 1975, 73MR8383

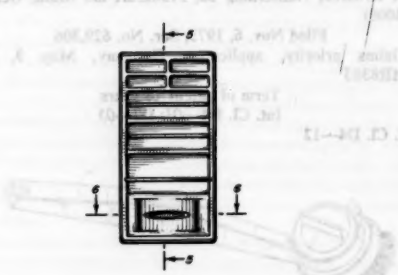
Term of patent 14 years
Int. Cl. D4—*01*; D7—*05*

U.S. Cl. D4—12

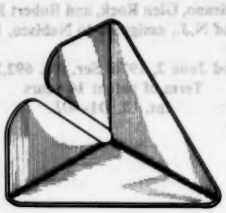


247,076
BRUSH
Mary C. MacCollum, 8908 Pickwick Drive, Indianapolis, Ind. 46260
Filed Aug. 9, 1976, Ser. No. 712,524
Term of patent 7 years
Int. Cl. D4—*02*
U.S. Cl. D4—35

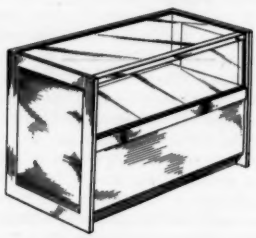
247,077
COMBINED TOWEL CADDY AND TISSUE DISPENSER
George S. Gruber, Hidden Hills, Calif., assignor to Dimensionetix, Inc., North Hollywood, Calif.
Filed Dec. 8, 1976, Ser. No. 748,646
Term of patent 14 years
Int. Cl. D23—*02*; D6—*04*
U.S. Cl. D6—91



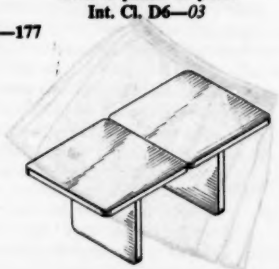
247,078
BOOK SUPPORT
Gerald M. Grusin, 2626 N. Lakeview, Chicago, Ill. 60614
Filed Nov. 2, 1976, Ser. No. 738,028
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—106



247,079
CABINET
Martin Otema, 140 Erskine Avenue, Toronto, Ontario, Canada
Filed Dec. 1, 1975, Ser. No. 636,512
Term of patent 14 years
Int. Cl. D6—*04*; D20—*02*
U.S. Cl. D6—172

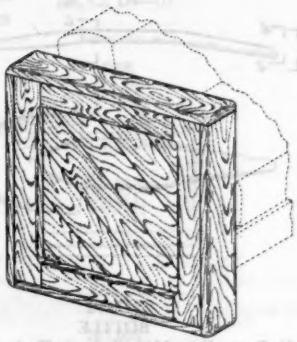


247,080
TABLE
Fuller Robinson, Jalisco, Mexico, assignor to Standard Desk Limited
Division of Ser. No. 448,506, March 6, 1974. This application Mar. 4, 1976, Ser. No. 664,062
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—177

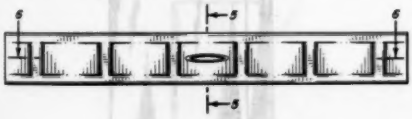


247,081
MOBILE DISPLAY RACK
Charles L. Davis, Atlanta, Ga., assignor to The Coca-Cola Company
Filed Jan. 30, 1976, Ser. No. 654,149
Term of patent 14 years
Int. Cl. D20—*02*; D12—*02*
U.S. Cl. D6—186

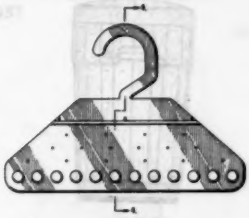
247,082
END STANDARD FOR A FURNITURE SEAT
Dick J. Thompson, Rte. 7, Box 430, Raleigh, N.C. 27612, and Edward P. Boatwright, 5312 Old Trinity Road, Raleigh, N.C. 27607
Filed May 24, 1976, Ser. No. 689,521
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—192



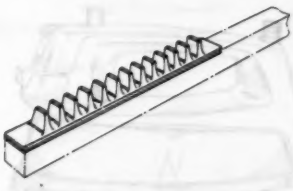
247,083
COMBINED VANITY SKIRT AND TISSUE DISPENSER
George S. Gruber, Hidden Hills, Calif., assignor to Dimensionetix, Inc., North Hollywood, Calif.
Filed Dec. 8, 1976, Ser. No. 748,645
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—192



247,084
HANGER FOR ORGANIZING JEWELRY
Louis P. De Mascole, 325 Red Chimney Drive, Warwick, R.I. 02886, and Donald C. Tatro, 95 Lloyd Road, Saunderstown, R.I. 02874
Filed June 11, 1976, Ser. No. 695,282
Term of patent 14 years
Int. Cl. D6—*08*
U.S. Cl. D6—247



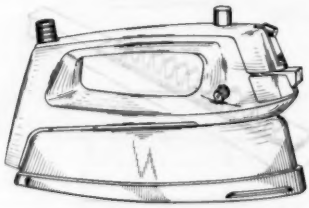
247,085
HANGER SUPPORT FOR DISPLAY RACKS
David C. F. Stoddard, Atlanta, Ga., assignor to Abrams Fixture Corporation, Atlanta, Ga.
Filed July 15, 1976, Ser. No. 705,360
Term of patent 14 years
Int. Cl. D6—*06*; D20—*02*
U.S. Cl. D6—257



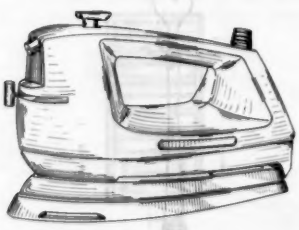
247,086
ARTICLE OF FLATWARE
Milton Gonshorek, Meriden, Conn., assignor to International Silver Company, Meriden, Conn.
Filed Apr. 25, 1975, Ser. No. 571,685
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—137

247,087
WASTE RECEPTACLE
Thomas Dickinson, University City, Mo., assignor to Contico International, Inc., St. Louis, Mo.
Filed Oct. 4, 1976, Ser. No. 729,210
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D7—194

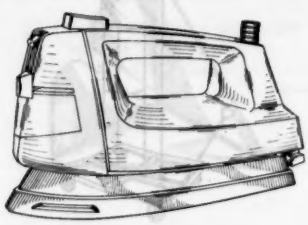
247,088
STEAM IRON
Thomas E. Hanson, Phoenixville, and Daniel A. Martin, Philadelphia, both of Pa., assignors to SCM Corporation, New York, N.Y.
Filed Apr. 19, 1976, Ser. No. 677,997
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—202



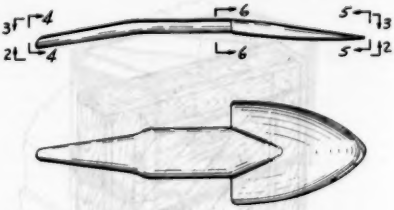
247,089
STEAM IRON
Thomas E. Hanson, Phoenixville, and Daniel A. Martin, Philadelphia, both of Pa., assignors to SCM Corporation, New York, N.Y.
Filed Apr. 19, 1976, Ser. No. 677,998
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—202



247,090
STEAM IRON
Thomas E. Hanson, Phoenixville, and Daniel A. Martin, Philadelphia, both of Pa., assignors to SCM Corporation, New York, N.Y.
Filed Apr. 19, 1976, Ser. No. 677,999
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—202



247,091
GARDENING AND AGRICULTURE HAND TOOL
Alexander E. Sandorf, 4559 Petit Ave., Encino, Calif. 91316
Filed Dec. 31, 1975, Ser. No. 645,684
Term of patent 14 years
Int. Cl. D8—*01*
U.S. Cl. D8—11



247,092
BOTTLE
Bisked U. Evangelista, 1363 Skyhawk Circle, and Eugenio D. Caburian, 1362 Skyhawk Circle, both of Virginia Beach, Va. 23454
Division of Ser. No. 649,572, Jan. 15, 1976. This application Mar. 18, 1977, Ser. No. 779,058
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—66

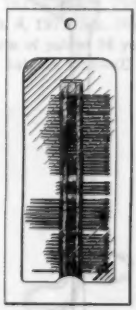
247,093
BOTTLE
Albert H. Torongo, Yardley, Pa., and Roland Johnson, Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed June 27, 1975, Ser. No. 590,905
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—116

247,094
BOTTLE
William James Britt, Greenville, S.C., assignor to Morton-Norwich Products, Inc.
Filed May 28, 1976, Ser. No. 691,182
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—129

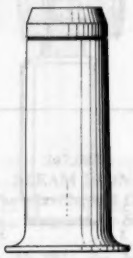
247,095
BOTTLE
Richard L. Weckman, Perrysburg, Ohio, assignor to Owens-Illinois, Inc.
Division of Ser. No. 617,352, Sept. 29, 1975, which is a division of Ser. No. 467,079, May 6, 1974. This application May 16, 1977, Ser. No. 797,084
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—157

247,096
BOTTLE
Richard L. Weckman, Perrysburg, Ohio, assignor to Owens-Illinois, Inc.
Division of Ser. No. 617,352, Sept. 29, 1975, which is a division of Ser. No. 467,079, May 6, 1974. This application May 16, 1977, Ser. No. 797,085
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—157

247,097
NEEDLE PACKAGE
Lionel Peter Preece, 7 Holt Gardens, Studley, Warwick County, England
Filed Mar. 19, 1976, Ser. No. 668,647
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—172

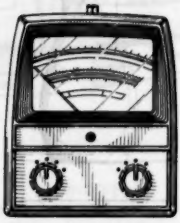


247,098
DISPENSER FOR PULVEROUS AND GRANULAR SUBSTANCES
Rafael Ferrante, Catamarca 27, Quilmes, Pcia. Buenos Aires, Argentina
Filed Jan. 14, 1975, Ser. No. 540,796
Claims priority, application Argentina, July 18, 1974, 25784; Jan. 14, 1975, 27161
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—208



247,099
MOISTURE METER
Edwin L. Schwartz, Los Angeles, Calif., assignor to Rite Autotronics Corporation, Los Angeles, Calif.
Filed Oct. 6, 1975, Ser. No. 620,039
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—56

247,100
IGNITION ANALYZER
Edwin L. Schwartz, Los Angeles, Calif., assignor to Rite Autotronics Corporation, Los Angeles, Calif.
Filed Oct. 6, 1975, Ser. No. 620,038
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—78

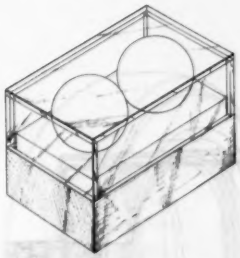


247,101
WIRE BRACELET WITH DETACHABLE DIAMOND CLASP
Alfred Joseph Durante, Forest Hills, N.Y., assignor to Cartier, Inc., New York, N.Y.
Continuation-in-part of Ser. No. 557,127, March 10, 1975, abandoned. This application Sept. 15, 1976, Ser. No. 723,631
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—4

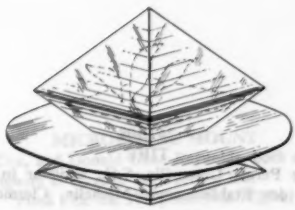
247,102
DIAMOND AND WIRE BRACELET
Alfred Joseph Durante, Forest Hills, N.Y., assignor to Cartier, Inc., New York, N.Y.
Continuation-in-part of Ser. No. 557,125, March 10, 1975, abandoned. This application Sept. 15, 1976, Ser. No. 723,633
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—5

247,103
IDENTIFICATION BRACELET
Elio Lossini, Johnston, R.I., assignor to Raybeth Tool & Die Co., Inc., Providence, R.I.
Filed June 1, 1976, Ser. No. 692,028
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—12

247,104
STATUETTE
Robert P. Novel, 2121 P St., NW., Washington, D.C. 20036
Filed Apr. 14, 1976, Ser. No. 676,681
Term of patent 3½ years
Int. Cl. D11—*02*
U.S. Cl. D11—131

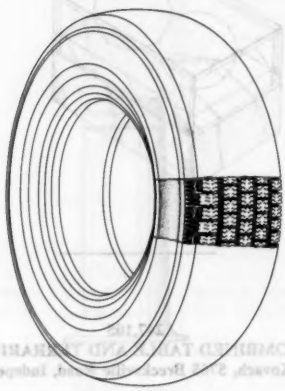


247,105
COMBINED TABLE AND TERRARIUM
Robert L. Kovach, 5765 Brecksville Road, Independence, Ohio 44131
Filed May 7, 1976, Ser. No. 684,378
Term of patent 14 years
Int. Cl. D11—*04*
U.S. Cl. D11—144

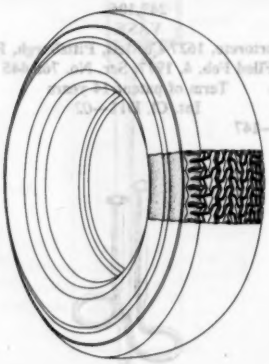


247,106
VASE
Michael A. Tortorete, 1627 Chislett, Pittsburgh, Pa. 15206
Filed Feb. 4, 1977, Ser. No. 765,445
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—147

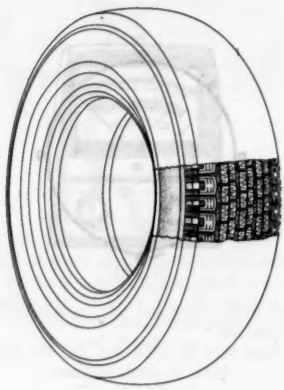
247,107
TIRE
Philippe Jamain, Chatel-Guyon, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France
Filed Oct. 21, 1976, Ser. No. 734,655
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—146



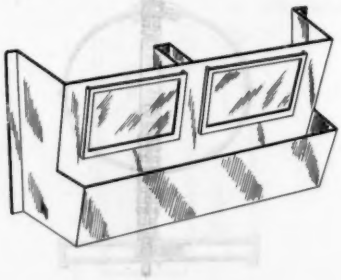
247,108
TIRE
Jean-Claude Peron, Greenville, S.C., assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France
Filed Jan. 17, 1977, Ser. No. 759,637
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—147



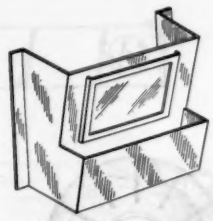
247,109
TIRE
Philippe Jamain, Chatel-Guyon, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France
Filed Oct. 21, 1976, Ser. No. 734,653
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—148



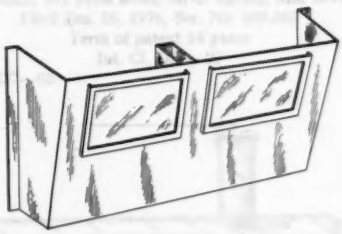
247,110
TRUCK CAB CADDY
Andre J. Olivan, 3970 Bayview Circle, Concord, Calif. 94520
Filed Apr. 28, 1976, Ser. No. 681,149
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—155



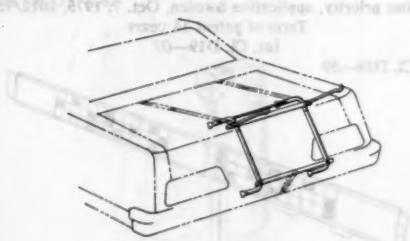
247,111
TRUCK CAB CADDY
Andre J. Olivan, 3970 Bayview Circle, Concord, Calif. 94520
Filed Apr. 28, 1976, Ser. No. 681,150
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—155



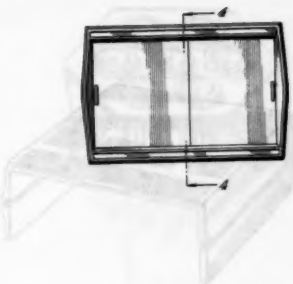
247,112
TRUCK CAB CADDY
Andre J. Olivan, 3970 Bayview Circle, Concord, Calif. 94520
Filed Apr. 28, 1976, Ser. No. 681,151
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—155



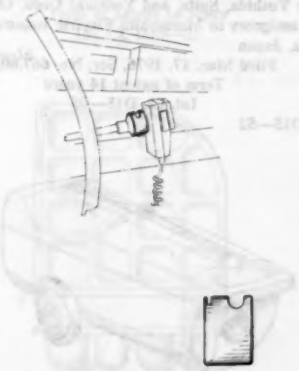
247,113
BICYCLE CARRIER FOR AUTOMOBILES
Raymond J. Federowicz, Columbus; William J. Hess, and Frank C. Ricciardi, Jr., both of Upper Arlington, all of Ohio, assignors to Dorcy Cycles Corporation, Columbus, Ohio
Filed Sept. 7, 1976, Ser. No. 720,795
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—158



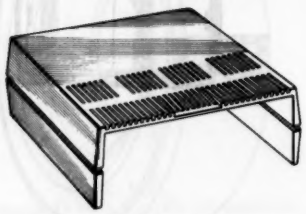
247,114
MODEM-CONTROL ACCESS PANEL
John S. Ebner, Boca Raton; Sheldon Steinman, Miramar, and Frederick W. Haase, Palm Springs North, all of Fla., assignors to Milgo Electronics Corporation, Miami, Fla.
Filed Sept. 15, 1976, Ser. No. 723,460
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—35



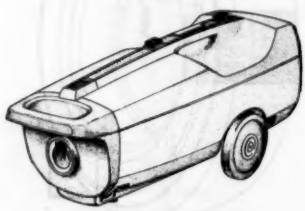
247,115
MICROPHONE MOUNT
Ivan Ray Cox, and Donald Gene Reynolds, both of Speedway, Ind., assignors to Rayden Enterprises, Inc.
Filed Feb. 28, 1977, Ser. No. 772,741
Term of patent 14 years
Int. Cl. D14—*03, 99*
U.S. Cl. D14—13



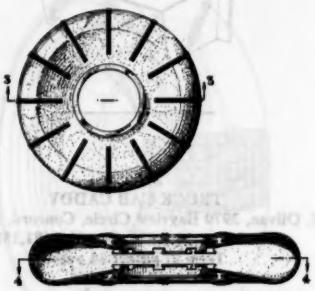
247,116
HOUSING FOR A DATA TERMINAL LOGIC MODULE OR SIMILAR ARTICLE
John Steven Ebner, Boca Raton, and Charles Grimes Sprecher, Pembroke Pines, both of Fla., assignors to Milgo Electronics Corporation, Miami, Fla.
Filed Mar. 2, 1976, Ser. No. 663,135
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—46



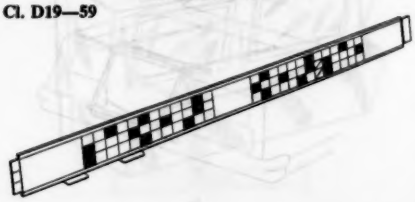
247,117
VACUUM CLEANER
Toshihiko Yoshida, Suita, and Yoshiaki Ueda, Osaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Mar. 17, 1976, Ser. No. 667,802
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D15—52



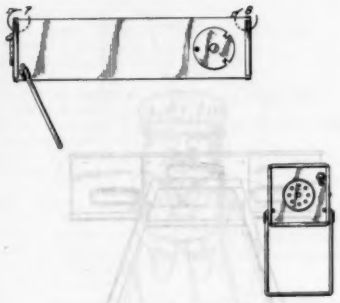
247,118
TIRE RETREADING BLADDER
Kenneth T. MacMillan, 4992 Wesleyan Woods Drive, Macon, Ga. 31204
Filed Aug. 13, 1976, Ser. No. 714,281
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—199



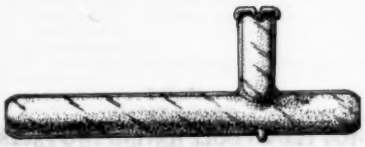
247,119
MUSIC TEACHING AID
Folke B. Nilsson, Knivsta, and Bengt Erik Lindahl, Spanga, both of Sweden, assignors to Almqvist & Wiksell Laromedel AB, Stockholm, Sweden
Filed Mar. 31, 1976, Ser. No. 672,494
Claims priority, application Sweden, Oct. 7, 1975, 2012/75
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—59



247,120
DRYER FOR WELDING RODS
Carl J. Siebert, 344 W. Harvard, Santa Ana, Calif. 92704
Filed May 10, 1976, Ser. No. 684,778
Term of patent 3½ years
Int. Cl. D23—*03*
U.S. Cl. D23—77

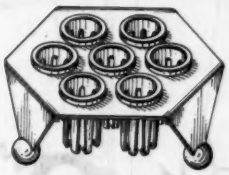


247,121
SMOKING DEVICE
Roger Graham, 931 Selin Road, Silver Spring, Md. 20910
Filed Jan. 16, 1976, Ser. No. 649,668
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D27—03

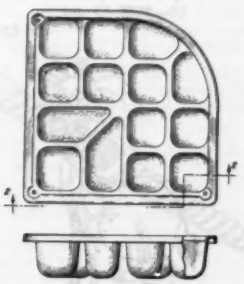


247,122
CIGARETTE LIGHTER
Sadao Yoshinaga, Tokyo, Japan, assignor to Yoshinaga Prince Co., Ltd., Tokyo, Japan
Filed Jan. 6, 1977, Ser. No. 757,385
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—42

247,123
LIPSTICK TUBE HOLDER
Vladimir Benes, 1512 5th Ave. W., No. 4, Seattle, Wash. 98119
Filed June 28, 1976, Ser. No. 700,099
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—86



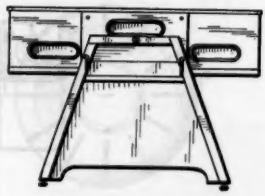
247,124
NUTRIENT FEEDING CONTAINER FOR ANIMALS
Robert A. Beecher, 311 3rd Ave. SE., Cascade, Iowa 52033
Filed Oct. 30, 1975, Ser. No. 627,182
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—16



247,125
PUPPET OR SIMILAR ARTICLE
Karl Corbett, 1361 Contra Costa Drive, and Sanford A. Chan, 5838 El Dorado, both of El Cerrito, Calif. 94530
Filed May 11, 1976, Ser. No. 685,296
Term of patent 3½ years
Int. Cl. D21—*01*
U.S. Cl. D34—2 R

247,126
ANIMAL TOY
Leo C. Whitmer, 3832 NE. Jacksonville Road, Ocala, Fla. 32679
Filed June 1, 1976, Ser. No. 691,231
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—2 R

247,127
COMBINED HOCKEY AND POOL GAME TABLE
Miroslav Kavka, 9117 Grant, Brookfield, Ill. 60513
Filed Aug. 23, 1976, Ser. No. 716,932
Term of patent 14 years
Int. Cl. D21—*01*; D6—*177;178;179*
U.S. Cl. D34—3



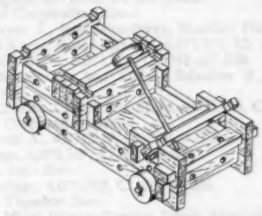
247,128
TOY CLOWN DOLL HAVING TWO FACES
Josephine I. Cantalupo, 515 Gregory Ave., Passaic, N.J. 07055
Filed July 21, 1975, Ser. No. 597,718
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—4 A

247,129
DOLL
Marjorie K. Fimreite, 2898 Kilburn Ave., and Ruth E. Thomas, 7 Westwood Ave., both of Napa, Calif. 94558
Filed June 10, 1976, Ser. No. 694,657
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—4 R

247,130
GAME BOARD
Ann E. Kelley, 6430 Stoney Island Ave., Chicago, Ill. 60637
Filed Dec. 22, 1975, Ser. No. 643,223
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS

247,131
NOVELTY TENNIS RACKET HAVING TWO HANDLES
Ted R. Simmoneau, P.O. Box C, Florence, Oreg. 97439
Filed June 1, 1976, Ser. No. 691,340
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 ST

247,132
TOY VEHICLE
Charles H. Gnehm, 2707 68th SE., Mercer Island, Wash. 98040
Filed Oct. 6, 1975, Ser. No. 619,833
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ



247,133
TOY DIGITAL WATCH
Darin M. Tiep, North Hollywood, Calif., assignor to Carrousel Party Favors, Inc., North Hollywood, Calif.
Filed Nov. 17, 1975, Ser. No. 632,453
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 R

247,134
GASOLINE PUMP
Hans P. L. Geisler, Hamburg, Germany, assignor to Deutsche Texaco Aktiengesellschaft, Germany
Filed Jan. 23, 1976, Ser. No. 651,743
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D52—2 A

247,135
DISC RECORD STORAGE UNIT TRAY
Michael B. Woodhall, Maidenhead, England, assignor to Cambra Cases Limited, England
Filed Dec. 9, 1975, Ser. No. 639,183
Term of patent 3½ years
Int. Cl. D14—*99*
U.S. Cl. D87—1 D

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 31ST DAY OF JANUARY, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. B. Chance Company: *See—*
Odom, James Thomas, 4,070,802, Cl. 52-23.000.
A. J. Gerrard & Company: *See—*
Simich, Emil, 4,070,733, Cl. 24-27.000.
A-T-O Inc.: *See—*
Mountford, George S., 4,071,266, Cl. 285-14.000.
AB Akerlund & Rausing: *See—*
Linner, Hans Rolf Ingemar, 4,070,952, Cl. 93-53.00R.
Abbott Laboratories: *See—*
Hunter, William Ward, Jr., 4,071,613, Cl. 424-1.000.
Johnson, Edwin Samuel; and Seely, John Hunter, 4,071,622, Cl. 424-177.000.
Stein, Robert George; and Couch, Terry Lee, 4,071,533, Cl. 260-332.500.
Abel, Heinz; and Berger, Alfred, to Ciba-Geigy Corporation. Wetting and anti-foaming agents, and process for removing foam from aqueous systems. 4,071,468, Cl. 252-321.000.
Abeles, Benjamin: *See—*
Pinch, Harry Louis; Abeles, Benjamin; and Gittleman, Jonathan Isaac, 4,071,426, Cl. 204-192.00F.
Abramitis, Walter W., to Akzona Incorporated. Plant growth control. 4,071,348, Cl. 71-78.000.
ACF Industries, Incorporated: *See—*
Moran, George A., Jr.; and Sitton, Willard J., 4,071,041, Cl. 137-246.220.
Acme Chemical Company: *See—*
Kahn, Joe E., 4,071,645, Cl. 427-340.000.
Acoustic Fiber Sound Systems, Inc.: *See—*
Croup, Robert E., 4,071,111, Cl. 181-149.000.
Advanced Technology Center, Inc.: *See—*
Schwemer, Warren C., 4,071,604, Cl. 423-445.000.
Aenishaenslin, Werner; Suter, Fritz; Pfeuti, Ulrich; and Haag, Paul, to Maschinenfabrik Wifag. Sequential rotary printing press web threading means. 4,070,965, Cl. 101-228.000.
Aeroquip Corporation: *See—*
Evans, Bryce B., 4,071,337, Cl. 55-212.000.
Aerospace General Co.: *See—*
Magill, Gilbert W., 4,071,206, Cl. 244-17.110.
Afonin, Mikhail Egorovich; Belyanin, Petr Nikolaevich; and Ivanov, Andrei Konstantinovich. Centrifugal separator for treating liquids. 4,071,188, Cl. 233-29.000.
Agarwal, Jagdish Chandra: *See—*
Marshall, David W.; and Agarwal, Jagdish Chandra, 4,071,737, Cl. 219-345.000.
AGFA-Gevaert, AG: *See—*
Ermel, Heinrich; Fruth, Franz; Fryda, Georg; Lang, Peter; Rau, Fritz; and Vossnacke, Jurgen, 4,071,296, Cl. 355-15.000.
Gersch, Josef; and Wiedemann, Otto, 4,071,202, Cl. 242-71.100.
Air Rotor Development Company, Inc.: *See—*
Ewers, Marion H., 4,071,022, Cl. 128-94.000.
Aircraft Inspections: *See—*
Earle, Ronald A., 4,070,898, Cl. 72-409.000.
Aisan Industry Company, Limited: *See—*
Konishi, Masami; Nakamura, Norihiko; Itou, Takaaki; and Kikuchi, Kazuo, 4,071,585, Cl. 261-36.00A.
Aisin Seiki Kabusihki Kaisha: *See—*
Yamamoto, Kimihiko; and Ishikawa, Hitoshi, 4,070,977, Cl. 112-259.000.
Ajinomoto Co., Inc.: *See—*
Soda, Kenji; Tanaka, Hidehiko; Nakazawa, Hidetsugu; and Mitsugi, Koji, 4,071,405, Cl. 195-29.000.
Takemoto, Tadashi; Kakizaki, Fusayoshi; and Ariyoshi, Yasuo, 4,071,511, Cl. 260-112.50R.
Akashi, Goro: *See—*
Ogawa, Hiroshi; Ishii, Kazuhide; Nakamura, Matsuaki; Tamai, Yasuo; and Akashi, Goro, 4,071,654, Cl. 428-336.000.
AKG Akustische u. Kino-Gerate Gesellschaft m.b.H.: *See—*
Fidi, Werner; and Moser, Horst, 4,071,717, Cl. 179-182.00R.
Akiyama, Keiichi, to Aluminum Alloy Refiners Association, a part interest. Process for the manufacture of aluminous cement from aluminum smelting residue. 4,071,373, Cl. 106-104.000.
Aktieselskabet Niro Atomizer: *See—*
Hovmand, Svend; and Liborius, Erik, 4,070,765, Cl. 34-10.000.
Akzona Incorporated: *See—*
Abramitis, Walter W., 4,071,348, Cl. 71-78.000.
Oosterwijk, Hendrik Harm Jannes, 4,071,579, Cl. 260-866.000.
van der Vies, Johannes, 4,071,623, Cl. 424-238.000.
Zengel, Hans; and Bergfeld, Manfred, 4,071,555, Cl. 260-566.00A.
Alban, William R. Fluid flow measuring apparatus. 4,070,910, Cl. 73-239.000.
Albertin, Michel; and Maurice, Louis, to Compagnie Industrielle des Telecommunications Clt-Alcatel S.A. Pumping unit for television tubes. 4,071,058, Cl. 141-65.000.
Alberts, Heinrich; and Bartl, Herbert, to Bayer Aktiengesellschaft. Graft polymers. 4,071,580, Cl. 260-878.00R.
Albright & Wilson Limited: *See—*
Williams, Thomas Alan, 4,071,603, Cl. 423-320.000.
Alcan Research and Development Limited: *See—*
McCubbin, John Gordon, 4,071,072, Cl. 164-89.000.
Aleksandrovic, Zabotin Aleksandr: *See—*
Santucci, Nicola; Aleksandrovic, Zabotin Aleksandr; Dmitrievich, Loschilin Evghenii; Lvovich, Galperin Aleksandr; and Archakovich, Onikov Eduard, 4,071,053, Cl. 139-436.000.
Santucci, Nicola; Aleksandrovic, Zabotin Aleksandr; Dmitrievich, Loschilin Evghenii; Lvovich, Galperin Aleksandr; Archakovich, Onikov Eduard; Aleksandrovich, Sakharov Boris; and Alekseevich, Borodin Valerian, 4,071,054, Cl. 139-436.000.
Aleksandrovich, Sakharov Boris: *See—*
Santucci, Nicola; Aleksandrovic, Zabotin Aleksandr; Dmitrievich, Loschilin Evghenii; Lvovich, Galperin Aleksandr; Archakovich, Onikov Eduard; Aleksandrovich, Sakharov Boris; and Alekseevich, Borodin Valerian, 4,071,054, Cl. 139-436.000.
Alekseevich, Borodin Valerian: *See—*
Santucci, Nicola; Aleksandrovic, Zabotin Aleksandr; Dmitrievich, Loschilin Evghenii; Lvovich, Galperin Aleksandr; Archakovich, Onikov Eduard; Aleksandrovich, Sakharov Boris; and Alekseevich, Borodin Valerian, 4,071,054, Cl. 139-436.000.
Alexander, Clair B.: *See—*
Smith, John L.; and Alexander, Clair B., 4,071,725, Cl. 200-82.00E.
Alexander, Gordon A., to Emhart Industries, Inc. Mortise lock having internal auxiliary spring for lever. 4,071,270, Cl. 292-169.220.
Alexandrescu, Mircea, to Siemens Aktiengesellschaft. Stationary magnetic tape transducing system with means for controlling the air bearing support. 4,071,863, Cl. 360-101.000.
Allegri, Theodore Henry, Sr. Aisle designators. 4,071,302, Cl. 404-12.000.
Allen, Joseph C., to Texaco Inc. Oil displacement fluid containing a solubilizing agent. 4,071,458, Cl. 252-8.55D.
Allied Chemical Corporation: *See—*
Amato, Wayne S.; Bandyopadhyay, Bhaskar; Fitch, Robert Herbert; and Kurtz, Bruce Edward, 4,071,572, Cl. 260-659.00A.
Booth, Frederick C., 4,071,204, Cl. 242-107.40B.
Mears, Whitney H.; and Orfeo, Sabatino R., 4,071,461, Cl. 252-63.500.
Ratcliffe, Charles T.; and Pap, Geza, 4,071,606, Cl. 423-569.000.
Allis-Chalmers Corporation: *See—*
Ernest, David A., 4,071,259, Cl. 280-95.00R.
Yamane, Isao, 4,071,309, Cl. 432-14.000.
Alps Motorola, Inc.: *See—*
Ejiri, Kazushige, 4,071,858, Cl. 360-93.000.
Altenschopfer, Theodor: *See—*
Schwuger, Milan Johann; Smolka, Heinz; Altenschopfer, Theodor; and Rostek, Manfred, 4,071,377, Cl. 134-29.000.
Altmann, Gideon: *See—*
Eisenberg, Eli; Altmann, Gideon; Bogokovsky, Biancs; and Lapidot, Mordechai, 4,071,412, Cl. 195-102.000.
Alton Corporation: *See—*
Mushinsky, Albert J., 4,071,820, Cl. 324-61.00R.
Aluminum Alloy Refiners Association: *See—*
Akiyama, Keiichi, 4,071,373, Cl. 106-104.000.
Aluminum Company of America: *See—*
Foster, Perry A., Jr.; and Jacobs, Stanley C., 4,071,420, Cl. 204-67.000.
Pearson, Alan; and Hart, Leroy D., 4,071,594, Cl. 264-63.000.
Amacoil Machinery, Inc.: *See—*
Tetreault, Merritt D., 4,071,198, Cl. 241-73.000.
Amano, Tadashi; Mukaihara, Yoshitaka; and Nakamura, Tadashi, to Konishiroku Photo Industry Co., Ltd. Transmittance densitometer. 4,071,299, Cl. 356-202.000.
Amato, Wayne S.; Bandyopadhyay, Bhaskar; Fitch, Robert Herbert; and Kurtz, Bruce Edward, to Allied Chemical Corporation. Cyclic ethylene oxyhydrochlorination process with reduced hydrocarbon emissions. 4,071,572, Cl. 260-659.00A.
Amersce Corporation: *See—*
Newnom, Richard S., 4,070,724, Cl. 10-162.00R.
American Can Company: *See—*
Mitchell, Richard Patrick; and Gorshe, Thomas Mathew, 4,070,852, Cl. 53-297.000.
Schlesinger, Sheldon I.; and Cochran, Veronica, 4,071,671, Cl. 526-89.000.
Wiesman, Dale C., 4,071,491, Cl. 260-28.50B.
American Colloid Company: *See—*
Clem, Arthur G., 4,070,839, Cl. 52-448.000.

American Cyanamid Company: *See—*
Kirby, Jane Parsons; and Borders, Donald Bruce, 4,071,560, Cl. 260-584.00R.
Like, Burton M., 4,071,333, Cl. 51-304.000.

American Home Products Corporation: *See—*
Sklar, Stanley, 4,071,620, Cl. 424-175.000.

American Hydrotherm Corporation: *See—*
Hinkle, Richard E., 4,071,075, Cl. 165-2.000.

American Optical Corporation: *See—*
Siegmund, Walter P., 4,071,343, Cl. 65-23.000.

AMP Incorporated: *See—*
Carter, Clyde Thomas, 4,070,755, Cl. 29-764.000.
Hogendobler, Richard Shure; and Murray, Robert Maclay, 4,070,751, Cl. 29-628.000.

Amphlett, Robert, to Lucas Industries Limited. Apparatus for use in the manufacture of a wiring harness. 4,071,393, Cl. 156-353.000.

Anadex, Inc.: *See—*
Weaver, John H., 4,070,963, Cl. 101-93.290.

Ancillotti, Francesco; Oriani, Gianni; and Pescarollo, Ermanno, to Snamprogetti S.p.A. Process for the production of methyl tert-butyl ether. 4,071,567, Cl. 260-614.00A.

Anderson, Bruce W., to Illinois Tool Works Inc. Telephone wall jack cover. 4,071,696, Cl. 179-1.0PC.

Anderson, Donald F.: *See—*
Yu, Arthur J.; and Anderson, Donald F., 4,071,675, Cl. 526-193.000.

Anderson, Francis L.: *See—*
Nichols, Roy A.; and Anderson, Francis L., 4,071,300, Cl. 401-175.000.

Anderson, Ralph E.: *See—*
La Haye, Paul G.; and Anderson, Ralph E., 4,070,841, Cl. 52-506.000.

Anderson, William B.: *See—*
Blanc, Max A., 4,071,024, Cl. 128-145.00A.

Ando, Akiko: *See—*
Yanagisawa, Hiroaki; Ando, Akiko; Fukushima, Masami; and Nakao, Hideo, 4,071,681, Cl. 542-420.000.

Andow, Fumio; Yamaura, Mitsuru; and Kitagawa, Minoru, to Tokyo Shibaura Denki Kabushiki Kaisha; and Chugoku Denryoku Kabushiki Kaisha. Apparatus for detecting abnormal conditions of transmitted signals. 4,071,873, Cl. 361-64.000.

Andrascheck, Hans-Joachim; Mucke, Rainer; Lorz, Werner; Borchard, Heinz; Buck, Jurgen; Kaothe, Herbert; and Rybka, Bruno, to Hoechst Aktiengesellschaft. Plastics foil for the manufacture of audio-visual information carriers. 4,071,490, Cl. 260-23.0XA.

Andrews, Harry N.; and Roman, Walter G., to Westinghouse Electric Corporation. Method and apparatus for protecting the core of a nuclear reactor. 4,071,403, Cl. 176-50.000.

ANIKHBI: Tsentralny Nauchne-issledevatelsky institut khlopehatobumiezhnoi promyshlinnesti: *See—*
Santucci, Nicola; Aleksandrovic, Zabotin Aleksandr; Dmitrievich, Loschilin Evghenii; Lvovich, Galperin Aleksandr; Archakovich, Onikov Eduard; Aleksandrovich, Sakharov Boris; and Alekseevich, Borodin Valerian, 4,071,054, Cl. 139-436.000.

Anstalt Europaische Handelsgesellschaft: *See—*
Frutiger, Peter, 4,071,693, Cl. 178-69.100.

Anthony, Thomas R.; and Cline, Harvey E., to General Electric Company. Process of making a deep diode solid state transformer. 4,071,378, Cl. 148-1.500.

Antolik, James E.: *See—*
Paden, Ernest D.; Antolik, James E.; and Boldman, Keith W., 4,070,734, Cl. 24-28.000.

Antonevich, John N., to Blackstone Corporation. Apparatus and methods for fluxless soldering. 4,071,179, Cl. 228-1.00A.

Aoki, Eiichiro, to Nippon Gakki Seizo Kabushiki Kaisha. Tone generator. 4,070,942, Cl. 84-1.010.

Aoki, Katsumichi; Shimizu, Susumu; Satake, Keigo; Yamazaki, Shiro; and Hatakeyama, Nobuo, to Kureha Kagaku Kogyo Kabushiki Kaisha. Fungicidal N-trichloroacetyl-N'-chlorobenzoylhydrazine derivatives. 4,071,633, Cl. 424-324.000.

Aoki, Masataka, to Hitachi, Ltd. Radiation shielding device for nuclear facilities. 4,071,404, Cl. 176-87.000.

Aono, Shigeo, to Nissan Motor Co., Ltd. Control system for engine exhaust gas recirculation according to engine operational condition. 4,071,003, Cl. 123-119.00A.

Apellaniz, Ramon, to Euracom S.A. Safety stoppering device. 4,071,157, Cl. 215-252.000.

Arai, Haruhiko: *See—*
Matsunaga, Kinjiro; Nakagawa, Yunosuke; and Arai, Haruhiko, 4,071,462, Cl. 252-99.000.

Arai, Kiyoyuki, to Copal Company Limited. Timer mechanism for use in a clock. 4,070,822, Cl. 58-38.00R.

Arakawa Rinsan Kagaku Kogyo Kabushiki Kaisha: *See—*
Ishibe, Shuhei; Okumichi, Toshiharu; Ishihara, Yasushi; and Naka, Hisayoshi, 4,071,375, Cl. 106-238.000.

Arbrook, Inc.: *See—*
Stockum, Glenn Francis, 4,070,713, Cl. 2-168.000.

Archakovich, Onikov Eduard: *See—*
Santucci, Nicola; Aleksandrovic, Zabotin Aleksandr; Dmitrievich, Loschilin Evghenii; Lvovich, Galperin Aleksandr; and Archakovich, Onikov Eduard, 4,071,053, Cl. 139-436.000.
Santucci, Nicola; Aleksandrovic, Zabotin Aleksandr; Dmitrievich, Loschilin Evghenii; Lvovich, Galperin Aleksandr; Archakovich, Onikov Eduard; Aleksandrovich, Sakharov Boris; and Alekseevich, Borodin Valerian, 4,071,054, Cl. 139-436.000.

ARCO Polymers, Inc.: *See—*
Miller, Robert W.; and Howell, Samuel Garry, 4,071,656, Cl. 428-626.000.
Weisser, Eugene P.; Osan, G. Alan; and Mailki, Edward P., 4,071,816, Cl. 324-30.00B.

Argus Chemical Corporation: *See—*
Wood, Donald W., 4,071,677, Cl. 526-231.000.

Arix, Robert J. Stop auto theft. 4,071,007, Cl. 123-146.50B.

Ariyoshi, Yasuo: *See—*
Takemoto, Tadashi; Kakizaki, Fusayoshi; and Ariyoshi, Yasuo, 4,071,511, Cl. 260-112.50R.

Armco Steel Corporation: *See—*
Hutton, Charles M., 4,071,191, Cl. 238-338.000.

Armor, Anthony F.; and Stanwick, Casmer P., to General Electric Company. Reverse flow cooled dynamoelectric machines with novel cooling system. 4,071,791, Cl. 310-59.000.

Armstrong Cork Company: *See—*
Gross, William G.; Long, Henry A., Jr.; and Yamshak, John R., 4,070,987, Cl. 118-257.000.

Arneklev, Duane R.; and Baker, Don R., to Stauffer Chemical Company. Sulfonamide herbicide antidote compositions and methods of use. 4,071,349, Cl. 71-88.000.

Arneklev, Duane R.; and Baker, Don R., to Stauffer Chemical Company. Sulfonamide herbicide antidote compositions and methods of use. 4,071,350, Cl. 71-100.000.

Arneklev, Duane R.; and Baker, Don R., to Stauffer Chemical Company. Sulfonamide herbicide antidote compositions and methods of use. 4,071,351, Cl. 71-100.000.

Arneklev, Duane R.; and Baker, Don R., to Stauffer Chemical Company. Sulfonamide herbicide antidote compositions and methods of use. 4,071,352, Cl. 71-100.000.

Arneklev, Duane R.; and Baker, Don R., to Stauffer Chemical Company. Sulfonamide herbicide antidote compositions and methods of use. 4,071,353, Cl. 71-100.000.

Arnold, Dan M.; and Paap, Hans J., to Texaco Inc. Detection of behind casing water flow at an angle to the axis of a well borehole. 4,071,757, Cl. 250-265.000.

Arnold, Dan McCay: *See—*
Supernaw, Irwin R.; Arnold, Dan McCay; and Link, Arthur Jurgen, 4,071,755, Cl. 250-253.000.

Arnold, Franz. Screw spindle. 4,070,921, Cl. 74-459.000.

Arntz-Optibelt-KG: *See—*
Ummen, Arnulf; and Muller, Alexander, 4,070,919, Cl. 74-229.000.

Aronson, Aaron B.: *See—*
Turek, Clarence W.; Aronson, Aaron B.; and Wittlock, Dale C., 4,071,131, Cl. 197-6.400.

Art-On Designs, Inc.: *See—*
Pernicano, Vincent S.; and Wright, Michael R., 4,071,139, Cl. 206-216.000.

Asahi Fancy Plywood Co., Ltd.: *See—*
Oka, Katsuhiko, 4,071,642, Cl. 427-243.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Okura, Zenichi, 4,071,850, Cl. 354-196.000.

Asano, Kiro: *See—*
Takahashi, Masaaki; Iizuka, Akira; and Asano, Kiro, 4,071,553, Cl. 260-514.00J.

Ash, Stephen R.; Wilcox, Philip G.; and Kessler, David P., to Purdue Research Foundation. Portable chemical reactor for use as an artificial kidney. 4,071,444, Cl. 210-22.00A.

Ashland Oil, Inc.: *See—*
Grimm, Robert A.; Randen, Neil A.; and Demas, Christopher L., 4,071,554, Cl. 260-558.00H.

Ashton, Charles R.: *See—*
Martin, Ronald A.; Ashton, Charles R.; and Watson, Richard D., 4,071,788, Cl. 310-42.000.

Ashton, Harold P.: *See—*
Burrows, Thomas M.; and Ashton, Harold P., 4,071,212, Cl. 248-37.600.

Asida, Tutomu: *See—*
Misono, Masayoshi; Koyama, Masaharu; and Asida, Tutomu, 4,070,749, Cl. 29-592.00R.

Associated Engineering Limited: *See—*
Atkins, Francis James, 4,071,800, Cl. 313-123.000.

Astorp, Norman E.: *See—*
Kuhns, Garrett D.; Astorp, Norman E.; Mullen, Richard V.; and Thomas, John Ellwood, 4,071,195, Cl. 239-289.000.

Atari, Inc.: *See—*
Bushnell, Nolan K.; and Keenan, Joseph F., 4,071,697, Cl. 179-2.0TV.

Atkins, Francis James, to Associated Engineering Limited. Three electrode arc plasma flame ignition devices. 4,071,800, Cl. 313-123.000.

Atkinson, Gary B.; and Nicks, Larry J., to United States of America, Interior. Preparation and use of high surface area transition metal catalysts. 4,071,473, Cl. 252-462.000.

Atlantic Richfield Company: *See—*
Smith, Robert H., 4,071,435, Cl. 208-91.000.

Atlas Copco Aktiebolag: *See—*
Herron, Lorne Robert; and Stromnes, Axel, 4,071,095, Cl. 173-152.000.

Attwood, Brian William: *See—*
Hicklin, Denis Raymond; White, Derek Graham Walter; and Attwood, Brian William, 4,071,651, Cl. 428-284.000.

Auburn Foundry, Inc.: *See—*
Fink, Richard A., 4,071,137, Cl. 198-774.000.

Austin, Forrest L.; and Cornelius, Richard T., to Cornelius Engineering Center, Inc. Combined pump and siphon. 4,070,725, Cl. 417-236.

Austin, Harvey B., Jr., to Globe Ticket Company. Reel for ticket rolls. 4,071,201, Cl. 242-55.200.

Australian Merino Wool Harvesting Limited: *See*—
Lines, Lancelot H., 4,070,938, Cl. 83-71.000.

Automatisme & Technique: *See*—
Bardet, Gerard, 4,070,740, Cl. 29-25.190.

Automobiles Peugeot: *See*—
Barres, Roland, 4,070,828, Cl. 60-274.000.

Avery, Theodore P. Contact lens and method of making same. 4,071,293, Cl. 351-160.000.

Ayerst McKenna and Harrison Ltd.: *See*—
Ferland, Jean-Marie; Laliberte, Real; Lippmann, Wilbur; and Pugsley, Thomas A., 4,071,552, Cl. 260-501.170.

Azimov, Alexandr Abramovich: *See*—
Fidchunov, Leonid Nikolaevich; Balyk, Stanislav Sergeevich; Silka, Adolf Nikolaevich; Kulakov, Nikolai Konstantinovich; Bakhtarov, Leonid Fedorovich; Azimov, Alexandr Abramovich; Davydenko, Vladimir Mikhailovich; Balitsky, Nikolai Vasilievich; Likhogub, Evgeny Petrovich; and Dorfman, Gersh Abramovich, 4,071,414, Cl. 201-40.000.

Baar, Walter, to Dr. -Ing. Rudolf Hell GmbH. Matrix engraving by electron beams. 4,071,731, Cl. 219-121.0EB.

Babej, Milos: *See*—
Kuhlein, Klaus; Reuschling, Dieter-Bernd; Babej, Milos; Bartmann, Wilhelm; and Beck, Gerhard, 4,071,530, Cl. 260-326.450.

Bacher, Rudolph John, to Du Pont de Nemours, E. I., and Company. Dielectric compositions of magnesium titanate and devices thereof. 4,071,881, Cl. 361-320.000.

Bade, Volkbert, to Th. Goldschmidt AG. Process for the manufacture of citric acid esters of partial fatty acid glycerides. 4,071,544, Cl. 260-410.700.

Bagcraft Corporation of America: *See*—
Ruda, Raymond J., 4,071,186, Cl. 229-62.000.

Bahel, Vijay Omprakash; and Kuehner, Richard, to Borg-Warner Corporation. Heat pump assisted solar powered absorption system. 4,070,870, Cl. 62-2.000.

Bahl, George R., to Suntech, Inc. High temperature electrochemical cell tester. 4,071,817, Cl. 324-30.00R.

Baierl, Kenneth W., to Flambeau Paper Company. Chemical concentration by sequential activated carbon adsorption and fractionation. 4,071,398, Cl. 162-15.000.

Bailey, John M.; and Robinson, Ronald R., to Caterpillar Tractor Co. Fuel injector with self-centering valve. 4,071,197, Cl. 239-533.110.

Baker, Don R.: *See*—
Arneklev, Duane R.; and Baker, Don R., 4,071,349, Cl. 71-88.000.
Arneklev, Duane R.; and Baker, Don R., 4,071,350, Cl. 71-100.000.
Arneklev, Duane R.; and Baker, Don R., 4,071,351, Cl. 71-100.000.
Arneklev, Duane R.; and Baker, Don R., 4,071,352, Cl. 71-100.000.
Arneklev, Duane R.; and Baker, Don R., 4,071,353, Cl. 71-100.000.

Baker, Thomas M., to Boeing Company, The. Mechanical mixer for controlling aircraft spoilers. 4,071,208, Cl. 244-83.00G.

Bakhtarov, Leonid Fedorovich: *See*—
Fidchunov, Leonid Nikolaevich; Balyk, Stanislav Sergeevich; Silka, Adolf Nikolaevich; Kulakov, Nikolai Konstantinovich; Bakhtarov, Leonid Fedorovich; Azimov, Alexandr Abramovich; Davydenko, Vladimir Mikhailovich; Balitsky, Nikolai Vasilievich; Likhogub, Evgeny Petrovich; and Dorfman, Gersh Abramovich, 4,071,414, Cl. 201-40.000.

Bala, John L., to Packaging Industries, Inc. Web handling apparatus. 4,070,951, Cl. 93-8.00R.

Balcerzak, Kazimierz: *See*—
Ciborowski, Stanislaw; Szczypinski, Zbigniew; Balcerzak, Kazimierz; Jaworski, Andrzej; Kasznia, Andrzej; Krzyaztoforski, Andrzej; Kurowski, Stanislaw; Redzi, Jan; and Szparski, Jozef, 4,071,561, Cl. 260-586.00P.

Baldwin, John J.; and Novello, Frederick C., to Merck & Co., Inc. Di-and tri-substituted 1,2,4-triazoles. 4,071,518, Cl. 260-256.40R.

Balitsky, Nikolai Vasilievich: *See*—
Fidchunov, Leonid Nikolaevich; Balyk, Stanislav Sergeevich; Silka, Adolf Nikolaevich; Kulakov, Nikolai Konstantinovich; Bakhtarov, Leonid Fedorovich; Azimov, Alexandr Abramovich; Davydenko, Vladimir Mikhailovich; Balitsky, Nikolai Vasilievich; Likhogub, Evgeny Petrovich; and Dorfman, Gersh Abramovich, 4,071,414, Cl. 201-40.000.

Ball Brothers Research Corporation: *See*—
Pardee, Robert P., 4,071,460, Cl. 252-51.50R.

Ball, Harry, to Olympic Engineering Co. Apparatus for manufacturing non-woven fabric tubular filter. 4,071,394, Cl. 156-465.000.

Bally Manufacturing Corporation: *See*—
Hooker, Donald E., 4,071,246, Cl. 273-143.00R.

Balogh, Andre, to Tork, Inc. Self-contained maintenance-free emergency lighting. 4,071,749, Cl. 362-20.000.

Balogh, Stephen M. Manually operated liquid dispenser. 4,071,172, Cl. 222-321.000.

Balyk, Stanislav Sergeevich: *See*—
Fidchunov, Leonid Nikolaevich; Balyk, Stanislav Sergeevich; Silka, Adolf Nikolaevich; Kulakov, Nikolai Konstantinovich; Bakhtarov, Leonid Fedorovich; Azimov, Alexandr Abramovich; Davydenko, Vladimir Mikhailovich; Balitsky, Nikolai Vasilievich; Likhogub, Evgeny Petrovich; and Dorfman, Gersh Abramovich, 4,071,414, Cl. 201-40.000.

Bandag Incorporated: *See*—
Graves, Thomas W.; and Seiler, Ronald, 4,071,071, Cl. 157-13.000.

Bandyopadhyay, Bhaskar: *See*—
Amato, Wayne S.; Bandyopadhyay, Bhaskar; Fitch, Robert Herbert; and Kurtz, Bruce Edward, 4,071,572, Cl. 260-659.00A.

Banitt, Elden H., to Riker Laboratories, Inc. Derivatives of urea. 4,071,524, Cl. 260-293.770.

Banks, Robert L.; and Kenton, Joseph R., to Phillips Petroleum Company. Catalysts for conversion of olefins. 4,071,471, Cl. 252-437.000.

Barch, Herbert W.: *See*—
Bohy, August G.; and Barch, Herbert W., 4,071,341, Cl. 65-11.00W.

Bardet, Gerard, to Automatisme & Technique. Continuous production hot-setting installation. 4,070,740, Cl. 29-25.190.

Barger, Franklin V., Jr.; Knox, Richard M.; and Roberts, Jefery R., to Barger, Franklin V., Jr. Telephone system for audio demonstration and marketing of goods or services. 4,071,698, Cl. 179-2.00R.

Baron, Paul: *See*—
Sedlmayer, Franz; Baron, Paul; and Seifert, Klaus, 4,070,868, Cl. 61-91.000.

Barone, Bruno J.: *See*—
Kerr, Ralph O.; and Barone, Bruno J., 4,071,539, Cl. 260-346.750.

Barosi, Aldo, to S.A.E.S. Getters S.p.A. Zr_2Ni as a getter metal and nuclear reactor fuel element employing such. 4,071,335, Cl. 55-68.000.

Barres, Roland, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Device and method for recycling hydrocarbon vapors of I.C.E. vehicles. 4,070,828, Cl. 60-274.000.

Barrow, Kevin David; and Mellows, Graham, to Beecham Group Limited. Antibiotics. 4,071,536, Cl. 260-345.80R.

Barrows, George H. Electronic calculator - register for hematology differentials. 4,071,891, Cl. 364-416.000.

Barsellotti, John Anthony, to International Standard Electric Corporation. Line circuit for key telephone systems. 4,071,712, Cl. 179-99.000.

Barth, Jordan B., to Colgate Palmolive Company. Flavored dentifrice. 4,071,615, Cl. 424-52.000.

Bartl, Herbert: *See*—
Alberts, Heinrich; and Bartl, Herbert, 4,071,580, Cl. 260-878.00R.

Bartmann, Wilhelm: *See*—
Kuhlein, Klaus; Reuschling, Dieter-Bernd; Babej, Milos; Bartmann, Wilhelm; and Beck, Gerhard, 4,071,530, Cl. 260-326.450.

BASF Aktiengesellschaft: *See*—
Burdorf, Donald L., 4,071,177, Cl. 226-7.000.
Koester, Eberhard; Wunsch, Gerd; Schoenafinger, Eduard; and Schneehage, Hans Henning, 4,071,610, Cl. 423-634.000.
Kummer, Rudolf; Schwirten, Kurt; Schindler, Hans-Dieter, deceased; Lang nee Schindler, Ute, heir-at-law; and Schindler, Rainer, heir-at-law, 4,071,563, Cl. 260-601.00R.
Rentzea, Costin; Zeeh, Bernd; Koenig, Karl-Heinz; and Pommer, Ernst-Heinrich, 4,071,685, Cl. 548-312.000.

Bassani Ticino S.p.A.: *See*—
Ranzanigo, Pierluigi, 4,071,837, Cl. 337-268.000.

Bassignani, Anthony L. Material measuring and dispensing device. 4,071,171, Cl. 222-305.000.

Bassler, Gerd, to Robert Bosch GmbH. Method to secure armature conductors to the commutator strips in dynamo electric machines. 4,071,730, Cl. 219-85.0CM.

Bates, L. Dexter: *See*—
Talmage, John E.; and Bates, L. Dexter, 4,071,689, Cl. 178-18.000.

Batts, John H., to John Thomas Batts, Inc. Articulated article support. 4,071,146, Cl. 211-87.000.

Bauer, Kurt; Molleken, Reiner; and Exner, Fritz, to Haarmann & Reimer Gesellschaft mit beschrankter Haftung. Process for the production of 2-alkoxy-4-alkenyl phenols. 4,071,564, Cl. 260-613.00D.

Bauerkemper, Michael, to Thomas & Betts Corporation. Hand tool for joining objects. 4,070,754, Cl. 29-749.000.

Bausch & Lomb Incorporated: *See*—
Dey, Thomas W., 4,071,748, Cl. 362-19.000.

Baxendale, Philip Noel: *See*—
Clark, William Frederick; Baxendale, Philip Noel; and Peters, Michael Noel, 4,071,364, Cl. 96-36.000.

Bayer Aktiengesellschaft: *See*—
Alberts, Heinrich; and Bartl, Herbert, 4,071,580, Cl. 260-878.00R.
Boehmke, Gunther, 4,071,543, Cl. 260-401.000.
Bueb, Michael; Kubitzek, Harry; Langhans, Arthur; Rellensmann, Wolfgang; and Wagner, Wolfram, 4,070,817, Cl. 57-157.0TS.
Gorski, Theodor; Heinen, Adolf; and Mack, Kurt, 4,071,443, Cl. 210-7.000.
Konig, Hans-Bodo; Metzger, Karl Georg; and Schrock, Wilfried, 4,071,683, Cl. 544-28.000.
Meckel, Walter; and Britain, J. W., 4,071,505, Cl. 260-77.5MA.
Rademachers, Jakob, 4,071,480, Cl. 260-2.50F.
Schroeder, Josef; and Schellhammer, Carl-Wolfgang, 4,071,466, Cl. 252-301.220.

Bayerische Motoren Werke Aktiengesellschaft: *See*—
v. d. Marwitz, Hans-Gunther, 4,070,712, Cl. 2-10.000.

BBC Brown, Boveri & Company Limited: *See*—
Bloch, Heinz; and Wirth, Ernst, 4,071,870, Cl. 361-21.000.

Beaupre, Donald M.; and Ferris, Harold A., to Farinon Electric of Canada Ltd. Telephone subscriber distribution system. 4,071,711, Cl. 179-41.00A.

Beck, Gerhard: *See*—
Kuhlein, Klaus; Reuschling, Dieter-Bernd; Babej, Milos; Bartmann, Wilhelm; and Beck, Gerhard, 4,071,530, Cl. 260-326.450.

Beckish, John. Golf swing training device. 4,071,251, Cl. 273-186.00R.

Beckman Instruments, Inc.: *See*—
Horrocks, Donald L., 4,071,761, Cl. 250-369.000.

Becton, Dickinson and Company: *See*—
Nugent, Edward L., 4,071,319, Cl. 23-254.00R.

Beecham Group Limited: *See*—
Barrow, Kevin David; and Mellows, Graham, 4,071,536, Cl. 260-345.80R.

Beeley, Micheal G.: *See*—
Thompson, Richard D.; Thompson, Douglas; and Beeley, Micheal G., 4,070,876, Cl. 68-3.00R.

Begou, Patrick, to Societe Chimique des Charbonnages. Products with a fluidifying action for mineral pastes and binders. 4,071,493, Cl. 260-42.130.

Behrmann, William C.; and Caulk, Robert H., to Exxon Research & Engineering Co. Process for regenerating fluorosulfuric acid catalyst. 4,071,576, Cl. 260-683.470.

Beiswenger, David W., to General Motors Corporation. Integral air switching diverter valve. 4,070,830, Cl. 60-290.000.

Beitzinger, Kurt: *See*—
Goldammer, Georg; and Beitzinger, Kurt, 4,070,814, Cl. 57-89.000.

Belkin, Evgeny Grigorievich: *See*—
Zherdev, Anatoly Vasilievich; Yakimenko, Grigory Savvich; Gritsuk, Lev Dmitrievich; Gorbik, Anatoly Stepanovicy; Belkin, Evgeny Grigorievich; Tseluiko, Jury Ivanovich; Gorodetsky, Yakov Izrailievich; Severin, Vasily Fedorovich; and Tolochko, Alexei Ivanovich, 4,071,230, Cl. 266-193.000.

Bell, Oliver A., Jr., to Colt Industries Operating Corporation. Adaptive control system and method for electrical discharge machining. 4,071,729, Cl. 219-69.00C.

Bell Telephone Laboratories, Incorporated: *See*—
Brophy, Francis Joseph; and Hayes, Jeremiah Francis, 4,071,908, Cl. 364-900.000.
DeNigris, Ernest Gerard; and Tutko, Albert John, 4,071,290, Cl. 339-258.00F.
Flanagan, James Loton; and Webber, Susan Anne, 4,071,695, Cl. 179-1.0VL.
Gibbs, Hyatt McDonald; McCall, Samuel Leverte, Jr.; and Venkatesan, Thirumalai Nallan Chakravarthy, 4,071,831, Cl. 330-4.300.
Hart, Terry Jonathan, 4,071,722, Cl. 200-50.00A.
Koontz, Donald Eldridge; and Skurkiss, Peter Kenny, 4,071,417, Cl. 204-38.00B.
Leeper, David Garth, 4,071,848, Cl. 343-844.000.
Owens, Gerald John, 4,071,888, Cl. 364-200.000.
Tewksbury, Stuart Keene, 4,071,842, Cl. 340-347.0AD.

Belyanin, Petr Nikolaevich: *See*—
Afonin, Mikhail Egorovich; Belyanin, Petr Nikolaevich; and Ivanov, Andrei Konstantinovich, 4,071,188, Cl. 233-29.000.

Bendix Corporation, The: *See*—
Johannesen, Donald Dixon, 4,071,118, Cl. 188-71.900.
Thuren, John B.; Datwyler, Walter F., Jr.; and Phipps, Jack R., 4,071,013, Cl. 123-32.0SP.

Benjamin, Benjamin C., to Schmelzer Corporation. Dashpot assembly. 4,071,119, Cl. 188-298.000.

Benkoe, Erwin: *See*—
Goldfarb, Adolph E.; and Benkoe, Erwin, 4,071,249, Cl. 273-161.000.

Bennet, David: *See*—
Halperin, Levi Ytzhak; Zioni, Dov; and Bennet, David, 4,071,116, Cl. 187-29.00R.

Bennett, John D., to Suntech, Inc. Apparatus for pulling tools into a wellbore. 4,071,086, Cl. 166-177.000.

Benson, Wayne J.; Torburn, Roy B.; and Tweed, Donald G., to GTE Automatic Electric Laboratories Incorporated. Pluggable protector holder for surge arrestor gas tubes. 4,071,876, Cl. 361-119.000.

Benthake, Heinrich, to WGW Westdeutsche Getriebe und Kupplungswerke GmbH. Multiple pinion concentric drive. 4,070,923, Cl. 74-665.00P.

Bentley, Floyd E., to Texaco Development Corporation. Aromatic polyamines and their preparation. 4,071,558, Cl. 260-570.00D.

Berardinelli, Frank M.: *See*—
Thomas, Norman W.; Berardinelli, Frank M.; and Edelman, Robert, 4,071,503, Cl. 260-75.00N.

Berger, Alfred: *See*—
Abel, Heinz; and Berger, Alfred, 4,071,468, Cl. 252-321.000.

Berger, Christian; Farge, Daniel; Gros, Georges; Messer, Mayer Naoum; and Moutonnier, Claude, to Rhone-Poulenc Industries. Oxathiino- and dithiino-aminoacetic acids. 4,071,531, Cl. 260-327.00P.

Bergfeld, Manfred: *See*—
Zengel, Hans; and Bergfeld, Manfred, 4,071,555, Cl. 260-566.00A.

Bernstein, Philip; Coffey, James P.; and Davis, Stanley M., to ESB Incorporated. Process for repairing defective battery seals. 4,071,661, Cl. 429-49.000.

Bethea, Tristram Walker; and Futamura, Shingo, to Firestone Tire & Rubber Company, The. Polyurethane-urea elastomers based on propylene oxide-tetrahydrofuran copolymers. 4,071,492, Cl. 260-31.80R.

Bevins, Jesse Althen. Intra-oral filtering device. 4,071,026, Cl. 128-147.000.

BICC Limited: *See*—
Jones, Edward Owen, 4,071,199, Cl. 242-25.00A.

Bijon, Paul; Fichot, Bernard; and Lainez, Lucien, to Thomson-Brandt. Device for the stabilization of flexible discs and more particularly of videodiscs and reading apparatus adapted to this device. 4,071,854, Cl. 358-128.000.

Bilczo, Dale Louis; Golonka, Kenneth Anthony; Overman, John Arthur; and Carroll, John Ernest, to Lincoln Electric Company, The. Electric arc welding power supply. 4,071,885, Cl. 363-64.000.

Bilson, David G.: *See*—
Folsom, Harold A.; and Bilson, David G., 4,070,972, Cl. 104-172.00S.

Bird, Jack Raymond, to United Kingdom of Great Britain and Northern Ireland, The Secretary of Defence, in Her Brittanic Majesty's Government of the. Silicon nitride NGV's and turbine blades. 4,071,372, Cl. 106-73.500.

Biro, Katalin: *See*—
Tuba, Zoltan; Marsai, Maria; Biro, Katalin; Szporny, Laszlo; Karpati, Egon; and Szeberenyi, Szabolcs, 4,071,515, Cl. 260-239.500.

Birum, Gail H., to Monsanto Company. Hydroxyphenylthiophosphoranylidene organophosphorus compounds. 4,071,584, Cl. 260-932.000.

Bishton, Norris J., Jr.; Rod, Robert L.; Wagenhals, Bruce; Woltanski, Theodore M.; and Blick, John S., III, to Monogram Industries, Inc. Sewerless recirculating toilet and human waste storage system. 4,070,714, Cl. 4-318.000.

Black Clawson Company, The: *See*—
Sternby, Arthur J.; and Cruea, Ronald D., 4,071,193, Cl. 239-11.000.

Black and Decker Manufacturing Company, The: *See*—
Cox, Denis Charles, 4,071,793, Cl. 310-71.000.

Blackstone Corporation: *See*—
Antonevich, John N., 4,071,179, Cl. 228-1.00A.

Blackwell, John, to Du Pont de Nemours, E. I., and Company. Green-yellow to orange monoazo paper dyes. 4,071,312, Cl. 8-7.000.

Blanc, Max A., to Blanc, Max A.; and Anderson, William B. Snorkel. 4,071,024, Cl. 128-145.00A.

Blanton, William A., Jr.; and Flanders, Robert L., to Chevron Research Company. Process for removing sulphur from a gas. 4,071,436, Cl. 208-120.000.

Blausey, Richard H., Jr., to Libbey-Owens-Ford Company. Glass sheet temperature control apparatus and method. 4,071,344, Cl. 65-29.000.

Bleiindustrie KG Vorm. Jung & Lindig: *See*—
Haberstroh, Gunter; and Heistermann, Lothar, 4,071,391, Cl. 156-325.000.

Blick, John S., III: *See*—
Bishton, Norris J., Jr.; Rod, Robert L.; Wagenhals, Bruce; Woltanski, Theodore M.; and Blick, John S., III, 4,070,714, Cl. 4-318.000.

Bloch, Daniel Richard, to S. C. Johnson & Son, Inc. Starch air freshener gels. 4,071,616, Cl. 424-76.000.

Bloch, Heinz; and Wirth, Ernst, to BBC Brown, Boveri & Company Limited. Apparatus to generate minimally delayed instructions for turbine valves in the event of power system short circuits. 4,071,870, Cl. 361-21.000.

Block, Barry, to Diax Corporation. Solid state force transducer and method of making same. 4,071,838, Cl. 338-47.000.

Boehmke, Gunther, to Bayer Aktiengesellschaft. Process for the preparation of acyltaurides. 4,071,543, Cl. 260-401.000.

Boeing Company, The: *See*—
Baker, Thomas M., 4,071,208, Cl. 244-83.00G.
Newell, Stanley Ernest, 4,070,908, Cl. 73-170.00R.

Boessler, Hanns; Quis, Peter; Buechse, Joachim; and Rauch, Hubert, to Rohm GmbH. Powdery copolymer comprising methyl methacrylate and monomer having a basic nitrogen atom. 4,071,653, Cl. 428-332.000.

Bogokovsky, Bianca: *See*—
Eisenberg, Eli; Altmann, Gideon; Bogokovsky, Bianca; and Lapidot, Mordechai, 4,071,412, Cl. 195-102.000.

Bogosh, Donald. Speedometer-odometer apparatus. 4,070,916, Cl. 73-490.000.

Bohn, Lothar: *See*—
Brinkmann, Ludwig; and Bohn, Lothar, 4,071,506, Cl. 260-78.00A.

Bohy, August G.; and Barch, Herbert W., to PPG Industries, Inc. Apparatus for forming glass fibers. 4,071,341, Cl. 65-11.00W.

Boldman, Keith W.: *See*—
Paden, Ernest D.; Antolik, James E.; and Boldman, Keith W., 4,070,734, Cl. 24-28.000.

Bollig, Georg; and Streubel, Hans, to Schloemann-Siemag Aktiengesellschaft. Continuous casting roller apron with overhang guide rings. 4,071,073, Cl. 164-448.000.

Bollig, Georg; Streubel, Hans; and Kolakowski, Manfred, to Schloemann-Siemag Aktiengesellschaft. Roller apron for a continuous casting installation. 4,071,074, Cl. 164-448.000.

Bolton, Gerald L.: *See*—
Masters, Ian M.; Bolton, Gerald L.; and Sefton, Verner B., 4,071,421, Cl. 204-96.000.

Bondar, Mikhail Jurievich: *See*—
Tkach, Khaim Berkovich; Kostylev, Alexandr Dmitrievich; Tupitsyn, Konstantin Konstantinovich; Gurkov, Konstantin Stepanovich; Klimashko, Vladimir Vasilievich; Rozhkov, Leonid Georgievich; Bondar, Mikhail Jurievich; and Smolyanitsky, Boris Nikolaevich, 4,070,948, Cl. 91-234.000.

Booher, Howard, to Bruce, Robert J.; and Tate, Mark T. Vertical pusher plate for a horizontally discharging semi-trailer. 4,071,153, Cl. 214-82.000.

Booth, Frederick C., to Allied Chemical Corporation. Multiple locking retractor. 4,071,204, Cl. 242-107.40B.

Bopp, Ernst: *See*—
Scherrer, Herbert; Bopp, Ernst; and Cecchetto, Ennio, 4,071,133, Cl. 197-168.000.

Borchard, Heinz: *See*—
Andrascheck, Hans-Joachim; Mucke, Rainer; Lorz, Werner; Borchard, Heinz; Buck, Jurgen; Knothe, Herbert; and Rybka, Bruno, 4,071,490, Cl. 260-23.0XA.

Borders, Donald Bruce: *See*—
Kirby, Jane Parsons; and Borders, Donald Bruce, 4,071,560, Cl. 260-584.00R.

Bordier, Jean-Louis Marie Henri: *See—*
Jammes, Emanuel Marie Augustin; and Bordier, Jean-Louis Marie Henri, 4,071,840, Cl. 340-166.500.
Borg-Warner Corporation: *See—*
Bahel, Vijay Omprakash; and Kuehner, Richard, 4,070,870, Cl. 62-2.000.
Calabretta, Peter Trent, 4,071,306, Cl. 418-82.000.
Hechenbleikner, Ingenuin, 4,071,583, Cl. 260-927.00R.
Mannino, Anthony, Jr., 4,071,360, Cl. 72-329.000.
Bosso, Joseph F.; and Wismer, Marco, to PPG Industries, Inc. Process for electrodeposition of quaternary ammonium salt group-containing resins. 4,071,428, Cl. 204-181.00C.
Bourgeois, Gerard J.; and Sahatjian, Ronald A., to Polaroid Corporation. Polymeric quaternary dye image receiving layers with overcoat. 4,071,366, Cl. 96-73.000.
Bourns, Inc.: *See—*
Morton, William David, Jr., 4,071,233, Cl. 271-8.00R.
Bourrie, Georges E.; and Lensel, Robert Marc, to R. Alkan & Cie. Automatic release and ejection locking mechanism. 4,071,271, Cl. 292-201.000.
Bouvet, Jean-Marie: *See—*
Lombard, Claude Edmond; and Bouvet, Jean-Marie, 4,071,042, Cl. 137-332.000.
Bowmar Instrument Corporation: *See—*
Harden, Phillip L., 4,071,718, Cl. 200-5.00A.
Box Innards, Inc.: *See—*
Peters, Charles Luther, Jr., 4,071,185, Cl. 229-28.00R.
Boyd, Cecil E.; and McGillvray, Bruce K. Pyramid pipe. 4,071,035, Cl. 131-173.000.
Boyer, David Harrison, III; and Mitchell, Richard Dale, to Koppers Company, Inc. Numerical control system for finishing machines. 4,071,896, Cl. 364-471.000.
Brakke, Henry Donald. Cutting apparatus. 4,070,810, Cl. 56-291.000.
Brana, George; and Vijayendran, Bheema Rao, to Pitney-Bowes, Inc. Treated ferromagnetic carrier particles for development powders. 4,071,655, Cl. 428-403.000.
Brandt, Theodore C., to General Electric Company. Check valve construction. 4,071,045, Cl. 137-528.000.
Braun, Werner, to Maxs AG. Coffee filter. 4,070,955, Cl. 99-284.000.
Bredbenner, Ambrose M., Jr., to Interpace Corporation. Battery feedthrough penetrator. 4,071,663, Cl. 429-181.000.
Brennan, Thomas E.; Hartmann, Robert H.; and McCoy, Robert M., to General Electric Company. Tieless bracing and method for supporting end turns of a dynamoelectric machine. 4,070,750, Cl. 29-596.000.
Bresler, Semen Khaimovich-Efimovich: *See—*
Peradze, Tamaz Vladimirovich; Fridman, Eidlya Abramovna; Zheleznova, Nina Vsevolodovna; Kolikov, Vsevolod Mikhailovich; Bresler, Semen Khaimovich-Efimovich; Mchedlishvili, Boris Viktorovich; Molodkin, Viktor Mikhailovich; Molodkina, Ljudmila Mikhailovna; and Katushkina, Nina Vasilievna, 4,071,619, Cl. 424-90.000.
Breslow, Jeffrey D., to Marvin Glass & Associates. Card game. 4,071,247, Cl. 273-308.000.
Bretschneider, Hermann; Hueber, Herman Pieter; and Louzil, Friedrich, to U.S. Philips Corporation. Dictation system. 4,071,716, Cl. 179-100.1DR.
Briar, Thomas J.: *See—*
Schaefer, William L.; and Briar, Thomas J., 4,071,342, Cl. 65-11.00R.
Bridgers, Frank H. Air conditioning system. 4,071,080, Cl. 165-59.000.
Brinkmann, Ludwig; and Bohn, Lothar, to Hoechst Aktiengesellschaft. Crystal-clear polyamides from 1,3-bis(aminomethyl)cyclohexane. 4,071,506, Cl. 260-78.00A.
Brinks, William G.: *See—*
Moomey, Henry E., Jr., 4,070,840, Cl. 52-489.000.
Bristol-Myers Company: *See—*
Kim, Choung Um, 4,071,513, Cl. 260-239.00A.
Britain, J. W.: *See—*
Meckel, Walter; and Britain, J. W., 4,071,505, Cl. 260-77.5MA.
British Gas Corporation: *See—*
Eales, David Frank, 4,071,329, Cl. 48-62.00R.
British Steel Corporation: *See—*
Hague, David P.; Malkani, Dalip T.; Middlemiss, Andrew; and Scholey, Stuart, 4,070,739, Cl. 29-18.000.
Brock, Eugene W., to General Motors Corporation. Interior lighting delay circuit. 4,071,805, Cl. 315-84.000.
Brock, Michael: *See—*
Cooke, Brian Alfred; and Brock, Michael, 4,071,379, Cl. 148-6.15Z.
Broks, John Doyle. Road emergency sign. 4,070,775, Cl. 40-492.000.
Brooks, Julius C.: *See—*
Pfeifer, Kenneth D.; and Brooks, Julius C., 4,070,730, Cl. 19-.580.
Brophy, Francis Joseph; and Hayes, Jeremiah Francis, to Bell Telephone Laboratories, Incorporated. Adaptive polling technique. 4,071,908, Cl. 364-900.000.
Brown, David C., to Rodney Hunt Company. Sluice gate assembly with extrudable seal. 4,070,863, Cl. 61-28.000.
Brown International Corporation: *See—*
Bushman, Ronald C.; and Holbrook, Franklin K., 4,070,959, Cl. 99-510.000.
Brown, James L., to Rockwell International Corporation. Analog-to-digital conversion means and associated lag compensated apparatus. 4,071,901, Cl. 364-605.000.
Brown, Joe R.; and Cochran, Chudleigh B., to Brown Oil Tools, Inc., by said Chudleigh B. Cochran. Well packer. 4,071,084, Cl. 166-129.000.
Brown, Kenneth Robson; and Kerr, Andrew Guy, to Ferranti Limited. Control of torsional deformation of elongate members. 4,070,800, Cl. 52-1.000.
Brown Oil Tools, Inc.: *See—*
Brown, Joe R.; and Cochran, Chudleigh B. (said Chudleigh B. Cochran assors. to), 4,071,084, Cl. 166-129.000.
Brown, Richard N., to General Electric Company. Coffeemaker with brewing water spreader. 4,070,956, Cl. 99-304.000.
Broyde, Barret; Delles, Judith Archer; and North, Steven Forrest, to Western Electric Company, Inc. Reclamation processing of vinyl chloride polymer containing materials and products produced thereby. 4,071,479, Cl. 260-2.300.
Bruce, Robert J.: *See—*
Booher, Howard, 4,071,153, Cl. 214-82.000.
Bruck, Abraham: *See—*
Shinitzky, Meir; and Bruck, Abraham, 4,071,770, Cl. 250-461.00B.
Bruckner, Ronald L.: *See—*
Stewart, John W.; and Bruckner, Ronald L., 4,071,877, Cl. 361-152.000.
Brullo, Robert A., to Minnesota Mining and Manufacturing Company. Thermally conductive electrical tape. 4,071,652, Cl. 428-323.000.
Brunnett, Carl J.; Cox, Jerome R., Jr.; Snyder, Donald L.; and Mattson, Rodney A., to Picker Corporation. Tomography system having nonconcurrent, compound axial scanning. 4,071,769, Cl. 250-445.00T.
Brunswick Corporation: *See—*
Frahm, James H., 4,071,002, Cl. 123-99.000.
Bubik, Alfred; Reutter, Siegfried; Schultz, Hans-Joachim; and Stotz, Wolf-Gunter, to Escher Wyss G.m.b.H. Separating system for separating two wires of a double-wire paper-making machine. 4,071,401, Cl. 162-300.000.
Buchi, George, to Hoffmann-La Roche Inc. Synthesis of hydroxycyclopenten-1-ones. 4,071,542, Cl. 260-348.480.
Buck, Jurgen: *See—*
Andrascheck, Hans-Joachim; Mucke, Rainer; Lorz, Werner; Borchard, Heinz; Buck, Jurgen; Knothe, Herbert; and Rybka, Bruno, 4,071,490, Cl. 260-23.0XA.
Bucyrus-Erie Company: *See—*
Hornagold, John T., 4,071,147, Cl. 212-145.000.
Bueb, Michael; Kubitzek, Harry; Langhans, Arthur; Rellensmann, Wolfgang; and Wagner, Wolfram, to Bayer Aktiengesellschaft. Process for texturing synthetic yarns. 4,070,817, Cl. 57-157.0TS.
Buechse, Joachim: *See—*
Boessler, Hanns; Quis, Peter; Buechse, Joachim; and Rauch, Hubert, 4,071,653, Cl. 428-332.000.
Burdorf, Donald L., to BASF Aktiengesellschaft. Self-centering air guide for tape transports. 4,071,177, Cl. 226-7.000.
Burke, James E.; and Grzesiak, Anthony J., to VCA Corporation. Aerosol valve tip and insert assembly. 4,071,196, Cl. 239-492.000.
Burleigh, John E.: *See—*
Uraneck, Carl A.; Burleigh, John E.; and Solomon, Paul W., 4,071,679, Cl. 526-338.000.
Burnett, Ronald H., to Corcom, Inc. Transient generator. 4,071,780, Cl. 307-262.000.
Burnett, Roy. Communication-recorder system. 4,071,710, Cl. 179-37.000.
Burroughs Corporation: *See—*
Collins, Joseph Martin, 4,070,761, Cl. 33-172.00F.
Burrows, Thomas M.; and Ashton, Harold P., to Imperial Knife Associated Companies, Inc. Implement rack. 4,071,212, Cl. 248-37.600.
Busch, Glen D. Crosstie adzing and boring machine. 4,071,060, Cl. 144-3.00H.
Bushman, Ronald C.; and Holbrook, Franklin K., to Brown International Corporation. Apparatus for extracting oil from the rind of whole citrus fruit. 4,070,959, Cl. 99-510.000.
Bushnell, Nolan K.; and Keenan, Joseph F., to Atari, Inc. Interactive video/telephone transmission system. 4,071,697, Cl. 179-2.0TV.
Buss, Dennis D., to Texas Instruments Incorporated. CTD programmable convolver. 4,071,906, Cl. 364-819.000.
Butsch, Otto R., to Sycor, Inc. Disc recorder drive follower assembly. 4,071,866, Cl. 360-106.000.
Butterfield, James L.; and Wright, George C., to Morton-Norwich Products, Inc. Method of alleviating hypertension. 4,071,632, Cl. 424-263.000.
Cailey, Ronald J., to Glass Master Corporation. Duct forming machine. 4,070,954, Cl. 93-36.900.
Calabretta, Peter Trent, to Borg-Warner Corporation. Rotary vane compressor with relief means for vane slots. 4,071,306, Cl. 418-82.000.
Calcagno, Benedetto: *See—*
Piccolo, Luigi; Calcagno, Benedetto; Ghirga, Marcello; and Paolinelli, Antonio, 4,071,347, Cl. 71-31.000.
Callahan, Bernard E.; and Christianson, Edward A., to Vapor Corporation. Slip-slide detector system for railway car wheels. 4,071,282, Cl. 303-106.000.
Cama, Lovji D.: *See—*
Christensen, Burton G.; and Cama, Lovji D., 4,071,529, Cl. 260-306.70C.
Camilleri, Thomas M. Lifts for ball elevator. 4,071,240, Cl. 273-49.000.
Camprubi, Amselmo Bolea, to Ingenieria Aplicada, S.A. Lance driving mechanism for shuttleless looms. 4,071,056, Cl. 139-449.000.
Canada Square Management Ltd.: *See—*
Moog, Gerhard W.; and Cooper, Kenneth R., 4,071,077, Cl. 165-18.000.
Canaday, William. Shower curtain fastener. 4,070,735, Cl. 24-73.0VA.
Canadian General Electric Co., Ltd.: *See—*
Rehder, Robert Henry, 4,071,882, Cl. 361-333.000.

Canevari, Louis T.: *See—*
Macari, Leonard J.; and Canevari, Louis T., 4,071,104, Cl. 177-229.000.
Canon Kabushiki Kaisha: *See—*
Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, 4,071,295, Cl. 355-3.0SH.
Marushima, Giichi; Tanaka, Hiroshi; Tosaka, Umi; Takahashi, Shinkichi; and Komiya, Takao, 4,071,361, Cl. 96-1.400.
Canright, Bruce W. Meat smoking and merchandise display case. 4,070,958, Cl. 99-468.000.
Caprioli, Bruno, to Forkardt, Gefitec. Chucking device for a machine tool. 4,070,935, Cl. 82-40.00R.
Carl, Jack C., to McGard, Inc. Vehicle hood lock. 4,070,880, Cl. 70-240.000.
Carlson, Cleo D. Apparatus for protecting a water faucet or the like from freezing temperatures. 4,071,043, Cl. 137-375.000.
Carlson, Robert G.; and Harrison, Robert W., to General Electric Company. Impact resistant blade. 4,071,184, Cl. 228-159.000.
Carlson, Wayland A.: *See—*
Miller, Ralph H., Jr.; Dyer, William W.; Waterbury, John A.; Carlson, Wayland A.; and Eastman, Richard O., 4,071,705, Cl. 179-15.0BA.
Miller, Ralph H., Jr.; Dyer, William W.; Waterbury, John A.; Carlson, Wayland A.; and Eastman, Richard O., 4,071,826, Cl. 325-39.000.
Carlsson, Lars Ake Ingemar; and Mulder, Jan Louis. Peptides having a high adrenocorticotropic effect and a method of producing the same. 4,071,510, Cl. 260-112.50R.
Caroff, Yves Robert, to Facom. Device for fixing vehicle wheels on a wheel-balancing machine. 4,070,915, Cl. 73-487.000.
Carpenter, Neil L.; and Goodman, Clark. Leaching methods and apparatus. 4,071,278, Cl. 299-5.000.
Carpenter, William R., to Medallion Instruments, Inc. Speed compensating Pitot tube apparatus. 4,070,909, Cl. 73-182.000.
Carroll, John Ernest: *See—*
Bilczo, Dale Louis; Golonka, Kenneth Anthony; Overman, John Arthur; and Carroll, John Ernest, 4,071,885, Cl. 363-64.000.
Carter, Clyde Thomas, to AMP Incorporated. Impact extraction tool. 4,070,755, Cl. 29-764.000.
Carts, Stanley L., Jr., to United States of America, Army. Aiming-/sighting device. 4,070,763, Cl. 33-241.000.
Casad, Burton M., to Continental Oil Company. Determination of residual oil in a subterranean formation. 4,071,756, Cl. 250-260.000.
Casasent, David Paul, to United States of America, Navy. Radar signal processor utilizing a multi-channel optical correlator. 4,071,907, Cl. 364-822.000.
Cassidy, Paul G. Negative friction pile and isolating casing. 4,070,867, Cl. 61-53.000.
Catalucci, Enrico, to Lonza, Ltd. Process for the production of aminocyanoacetic acid ethyl ester. 4,071,550, Cl. 260-465.400.
Caterpillar Tractor Co.: *See—*
Bailey, John M.; and Robinson, Ronald R., 4,071,197, Cl. 239-533.110.
Crabb, Elmer Ray, 4,071,129, Cl. 292-246.000.
Easterling, Gene B., 4,071,090, Cl. 172-788.000.
Junck, John A.; Dezelan, Joseph A.; Larson, Donald J.; and White, Robert W., 4,071,106, Cl. 180-44.00F.
Kraina, Jack H., 4,071,009, Cl. 123-198.00E.
Leighty, Conard E., 4,071,107, Cl. 180-69.00R.
McDaniel, John H.; Sinnard, Harry W.; and Thomas, Robert W., 4,070,940, Cl. 83-464.000.
Miller, Robert H., 4,071,010, Cl. 123-198.00F.
Morris, Carlisle S., 4,071,091, Cl. 172-797.000.
Stedman, Robert N., 4,071,277, Cl. 298-22.00P.
Cates, H. Alton. Directional control poppet valve. 4,071,046, Cl. 137-596.150.
Caulk, Robert H.: *See—*
Behrmann, William C.; and Caulk, Robert H., 4,071,576, Cl. 260-683.470.
Cecchetto, Ennio: *See—*
Scherrer, Herbert; Bopp, Ernst; and Cecchetto, Ennio, 4,071,133, Cl. 197-168.000.
Cecil, Nelson Lothair, to Royal Development Company, Inc. Recliner chairs. 4,071,276, Cl. 297-85.000.
Celanese Corporation: *See—*
Stackman, Robert W.; and Conciatori, Anthony B., 4,071,499, Cl. 260-47.00C.
Thomas, Norman W.; Berardinelli, Frank M.; and Edelman, Robert, 4,071,503, Cl. 260-75.00N.
Centralny Osrodek Badawczo-Rozwojowy Naszyn Wlokienniczych: *See—*
Ostrowski, Jerzy; Sierputowski, Piotr; Turkowski, Lukasz; Jablkiewicz, Jerzy; Pacholski, Jan; and Jedryka, Tadeusz, 4,070,812, Cl. 57-58.890.
Centralny Osrodek Projektowokonstrukcyjny Maszyn Gorniczych "Komag": *See—*
Jedo, Antoni; Jachna, Waclaw; and Szczesny, Adolf, 4,071,440, Cl. 209-44.000.
Cerola, Joseph J.: *See—*
Jenn, Louis J.; and Cerola, Joseph J., 4,071,738, Cl. 219-400.000.
Jenn, Louis J.; and Cerola, Joseph J., 4,071,739, Cl. 219-400.000.
Chalmers, John H., Jr.: *See—*
Zimmerman, Sheldon B.; and Chalmers, John H., Jr., 4,071,631, Cl. 424-263.000.
Champion International Corporation: *See—*
Gaylord, Norman G., 4,071,494, Cl. 260-42.140.
Vincent, David N.; and Chang, Cheng Hsiung, 4,071,469, Cl. 252-364.000.
Chang, Cheng Hsiung: *See—*
Vincent, David N.; and Chang, Cheng Hsiung, 4,071,469, Cl. 252-364.000.
Chang, David R.; and Grisik, John J., to General Electric Company. Method of applying a metallic coating with improved resistance to high temperature to environmental conditions. 4,071,638, Cl. 427-192.000.
Chao, Eric En-Kuang: *See—*
Cheng, Kuang Lu; and Chao, Eric En-Kuang, 4,071,427, Cl. 204-195.00M.
Chapman, James. Basketball goal assembly. 4,071,238, Cl. 273-1.50R.
Charbonnages de France: *See—*
Chauvin, Raymond; and Guillon, Pierre M. M., 4,071,304, Cl. 427-185.000.
Charles Churchill Limited: *See—*
Sladdin, Stuart Rodney; and Thorneycroft, Malcolm, 4,070,934, Cl. 82-2.00R.
Charles Richards Fasteners Limited: *See—*
Goldby, Richard Charles, 4,071,067, Cl. 151-22.000.
Charlton, Thomas L.; Redden, Robert F.; Hirsch, Horst E.; and Liang, Shou C., to Cominco Ltd. Process for concentrating and recovering gallium. 4,071,422, Cl. 204-105.00R.
Charransol, Pierre; Hauri, Jacques; and Fontana, Serge, to Thomson-CSF. Time division exchange and a method for the reconfiguration of this exchange. 4,071,702, Cl. 179-15.0AT.
Chateau, Guy. Analytical tape medium. 4,071,315, Cl. 23-230.00B.
Chaudhuri, Partha S., to Westvaco Corporation. Automatically controlled machine for making double-faced polyboard. 4,071,392, Cl. 156-351.000.
Chauvin, Raymond; and Guillon, Pierre M. M., to Charbonnages de France. Separation of products in granular form. 4,071,304, Cl. 427-185.000.
Chemed Corporation: *See—*
Holdt, Donald, 4,070,992, Cl. 122-382.000.
Paul, Stewart N., 4,071,450, Cl. 210-53.000.
Chemplex Company: *See—*
Hwang, Yu-Tang, 4,071,673, Cl. 526-123.000.
Chen, Nai Yuen, to Mobil Oil Corporation. Pre-engine converter. 4,070,993, Cl. 123-3.000.
Cheng, Kuang Lu; and Chao, Eric En-Kuang, to University of Missouri, Curators of the. Arsenite electrode. 4,071,427, Cl. 204-195.00M.
Cheskis, Harvey P.; Shapiro, Stanley; and Crane, Jacob, to Olin Corporation. Copper base alloys. 4,071,359, Cl. 75-160.000.
Chevron Research Company: *See—*
Blanton, William A., Jr.; and Flanders, Robert L., 4,071,436, Cl. 208-120.000.
Graves, Thomas M.; and Koundakjian, Theodore H., 4,071,617, Cl. 424-78.000.
Marquis, David M., 4,071,540, Cl. 260-346.760.
Parker, Phillip H., 4,071,486, Cl. 260-18.00N.
Chicago Pneumatic Tool Company: *See—*
Wallace, William K., 4,071,092, Cl. 173-12.000.
Chielens, Alain; and Henin, Jean-Pierre, to Fives-Cail Babcock. Internally cooled roller. 4,071,081, Cl. 165-82.000.
Chilson, Richard E. Continuously leaching an ore column. 4,071,611, Cl. 423-658.500.
Cholat-Serpoud, Gerard: *See—*
Legrand, Maurice Francois; and Cholat-Serpoud, Gerard, 4,071,264, Cl. 280-610.000.
Chore-Time Equipment Inc.: *See—*
Swartzendruber, Ray E., 4,070,990, Cl. 119-53.000.
Christensen, Burton G.; and Cama, Lovji D., to Merck & Co., Inc. Derivatives of 6-aminopenicillanic acid. 4,071,529, Cl. 260-306.70C.
Christenson, James Gordon; and Muccino, Richard R., to Hoffmann-La Roche Inc. Tritiated O-benzoylecgonine. 4,071,522, Cl. 260-292.000.
Christiana Metals Corporation: *See—*
Walraven, Thomas A.; Thomas, John G.; and Hall, James B., 4,071,182, Cl. 228-110.000.
Christianson, Edward A.: *See—*
Callahan, Bernard E.; and Christianson, Edward A., 4,071,282, Cl. 303-106.000.
Christy, Marcia E.: *See—*
Engelhardt, Edward L.; and Christy, Marcia E., 4,071,570, Cl. 260-649.00F.
Chrysler United Kingdom Limited: *See—*
Wyman, Howard John, 4,070,922, Cl. 74-573.00R.
Chugoku Denryoku Kabushiki Kaisha: *See—*
Andow, Fumio; Yamaura, Mitsuru; and Kitagawa, Minoru, 4,071,873, Cl. 361-64.000.
Chung, Daniel A., to Goodyear Tire & Rubber Company, The. Solid polyurethane tire and wheel assembly. 4,071,279, Cl. 301-63.0PW.
Ciba-Geigy Corporation: *See—*
Abel, Heinz; and Berger, Alfred, 4,071,468, Cl. 252-321.000.
Dexter, Martin; and Steinberg, David Herbert, 4,071,497, Cl. 260-45.85B.
Seltzer, Raymond; and Gordon, David A., 4,071,477, Cl. 260-2.00N.
Ciborowski, Stanislaw; Szczypinski, Zbigniew; Balcerzak, Kazimierz; Jaworski, Andrzej; Kasznia, Andrzej; Krzysztoforski, Andrzej; Kurowski, Stanislaw; Redzi, Jan; and Szparski, Jozef, to Zaklady Azotowe im. F. Dzierzinskiego. Method of prevention of disturbances and/or effects of disturbances in the reaction system of oxida-

tion of hydrocarbons in a liquid phase under pressure with gases containing oxygen. 4,071,561, Cl. 260-586.00P.
Cincinnati Milacron Inc.: *See—*
Funke, Manfred Maximilian, 4,071,015, Cl. 125-11.0AT.
Claassen, Volkert: *See—*
van Dijk, Jan; Claassen, Volkert; and Zwagemakers, Johannes Maria Antonius, 4,071,686, Cl. 560-35.000.
Clark Control, Inc.: *See—*
Russo, Roland; and Schneider, Richard, 4,071,835, Cl. 335-133.000.
Clark Equipment Company: *See—*
Hand, Gene F., 4,070,858, Cl. 60-422.000.
Clark, William Frederick; Baxendale, Philip Noel; and Peters, Michael Noel. Process of photoetching a metal comb. 4,071,364, Cl. 96-36.000.
Claude Neon Industries Limited: *See—*
Gilmour, Ralph M., 4,070,779, Cl. 40-575.000.
Clem, Arthur G., to American Colloid Company. Moisture impervious panel. 4,070,839, Cl. 52-448.000.
Cleveland Metal Abrasive, Inc.: *See—*
Dunkerley, Fred J.; Gaudino, Albert J.; and Vilyus, Robert P., 4,071,381, Cl. 148-36.000.
Cleveland Vibrator Company, The: *See—*
Crewse, John L., 4,070,947, Cl. 91-39.000.
Cline, Harvey E.: *See—*
Anthony, Thomas R.; and Cline, Harvey E., 4,071,378, Cl. 148-1.500.
Cloke, Robert L., to Sperry Rand Corporation. Current controlled oscillator. 4,071,832, Cl. 331-117.00R.
Coats & Clarke, Inc.: *See—*
Einhorn, Ruediger, 4,071,216, Cl. 248-290.000.
Cochin, Yves: *See—*
Reverend, Roger; and Cochin, Yves, 4,070,835, Cl. 52-235.000.
Cochran, Chudleigh B.: *See—*
Brown, Joe R.; and Cochran, Chudleigh B., 4,071,084, Cl. 166-129.000.
Cochran, Veronica: *See—*
Schlesinger, Sheldon I.; and Cochran, Veronica, 4,071,671, Cl. 526-89.000.
Codorniu, Francisco Lorente, to Nordiska Maskinfilt Aktiebolaget. Double-layer forming fabric. 4,071,050, Cl. 139-383.00R.
Cody, David L., to Symons Corporation. Multi-purpose concrete formwork structural member with novel facilities for extending the effective length thereof. 4,070,845, Cl. 52-632.000.
Coffey, James P.: *See—*
Bernstein, Philip; Coffey, James P.; and Davis, Stanley M., 4,071,661, Cl. 429-49.000.
Cogan, Richard M., to General Electric Company. Fabrication method and fabricated article. 4,071,183, Cl. 228-173.00A.
Cohen, Choua; and Sillion, Bernard, to Institut Francais du Petrole. Alkyl-guanidino-heterocyclic compounds, their manufacture and use as additives for fuels and lubricants. 4,071,459, Cl. 252-50.000.
Cohen, Noal; Rosenberger, Michael; and Saucy, Gabriel, to Hoffman-La Roche, Inc. Steroid total synthesis process utilizing a cyanoalkyl A-ring precursor. 4,071,537, Cl. 260-345.90S.
Colgate Palmolive Company: *See—*
Barth, Jordan B., 4,071,615, Cl. 424-52.000.
Grimm, John Edward, III, 4,071,614, Cl. 424-49.000.
Collier, John R.; and Pilette, Yvan P., to Du Pont de Nemours, E. I., and Company. Channeled photosensitive element. 4,071,367, Cl. 96-79.000.
Collins, Joseph Martin, to Burroughs Corporation. Printing press with inventory control. 4,070,761, Cl. 33-172.00F.
Collins, William Joseph: *See—*
Ernster, Peter Jacob; Collins, William Joseph; and Schaefer, George Henry, 4,071,789, Cl. 310-50.000.
Colt Industries Operating Corporation: *See—*
Bell, Oliver A., Jr., 4,071,729, Cl. 219-69.00C.
Columbus McKinnon Corporation: *See—*
Schreyer, Kenneth D.; and Rohosy, Soma M., 4,070,823, Cl. 59-93.000.
Combustion Engineering, Inc.: *See—*
Krisst, Raymond J., 4,071,818, Cl. 324-208.000.
Palmer, David Nelson; and Heikoff, Stanley, 4,071,639, Cl. 427-156.000.
Cominco Ltd.: *See—*
Charlton, Thomas L.; Redden, Robert F.; Hirsch, Horst E.; and Liang, Shou C., 4,071,422, Cl. 204-105.00R.
Commercial Shearing, Inc.: *See—*
Juvrud, Ingvald O., 4,070,866, Cl. 61-45.00R.
Commissariat a l'Energie Atomique: *See—*
de Cachard, Maurice; Moracchioli, Robert; and Marie, Gerard, 4,070,871, Cl. 62-116.000.
Guidez, Joel; Lecouvreur, Paul; and Roumailhac, Jean, 4,071,303, Cl. 415-112.000.
Commonwealth of Australia, The: *See—*
Kossoff, George, 4,070,905, Cl. 73-614.000.
Lines, Lancelot H., 4,070,938, Cl. 83-71.000.
Commonwealth Scientific and Industrial Research Organization: *See—*
Guise, Geoffrey Bruce, 4,071,313, Cl. 8-127.600.
Compagnie Francaise de Raffinage: *See—*
Engelhard, Philippe; Weisang, Joseph Edouard; and Paris, Guy, 4,071,437, Cl. 208-137.000.
Compagnie Generale des Etablissements Michelin: *See—*
Lejeune, Daniel, 4,071,724, Cl. 200-61.250.
Compagnie Honeywell Bull: *See—*
Edon, Guy, 4,070,966, Cl. 101-269.000.
Compagnie Industrielle des Telecommunications Clt-Alcatel S.A.: *See—*
Albertin, Michel; and Maurice, Louis, 4,071,058, Cl. 141-65.000.
Comte, Georges, to Les Cables de Lyon S.A. Helical wave guide. 4,071,834, Cl. 333-95.00R.
Conciatori, Anthony B.: *See—*
Stackman, Robert W.; and Conciatori, Anthony B., 4,071,499, Cl. 260-47.00C.
Congoleum Corporation: *See—*
Frisch, Rudolf, 4,071,592, Cl. 264-54.000.
Continental Can Co. Inc.: *See—*
Mazur, Richard A., 4,071,911, Cl. 364-900.000.
Continental Oil Company: *See—*
Casad, Burton M., 4,071,756, Cl. 250-260.000.
Leach, Bruce E.; and Starks, Charles M., 4,071,566, Cl. 260-621.00D.
Oertle, Donald H., 4,071,011, Cl. 137-317.000.
Contraves AG: *See—*
Eicher, Walter, 4,071,886, Cl. 364-118.000.
Cook, Alan Frederick, to Hoffmann-La Roche Inc. 5'-Deoxy-5-fluoropyrimidine nucleosides. 4,071,680, Cl. 536-23.000.
Cook, James W.; Khalid, Joseph M.; and Oster, Clark L., to Square D Company. Current limiting circuit breaker. 4,071,836, Cl. 335-195.000.
Cooke, Brian Alfred; and Brock, Michael, to Imperial Chemical Industries Limited. Phosphating method. 4,071,379, Cl. 148-6.15Z.
Cooke, Gordon R. Fluid fill or bleed apparatus. 4,071,012, Cl. 137-321.000.
Cooper, Glenn Dale; and Floryan, Daniel Edwin, to General Electric Company. Process for recovery of catalyst from polymerization of polyphenylene ethers. 4,071,500, Cl. 260-47.0ET.
Cooper Industries, Inc.: *See—*
Krubski, George, 4,071,144, Cl. 211-13.000.
Cooper, Kenneth R.: *See—*
Moog, Gerhard W.; and Cooper, Kenneth R., 4,071,077, Cl. 165-18.000.
Coors Container Company: *See—*
Gombas, Laszlo Attila, 4,070,888, Cl. 72-91.000.
Myers, James Lewis, 4,071,192, Cl. 239-3.000.
Copal Company Limited: *See—*
Arai, Kiyoyuki, 4,070,822, Cl. 58-38.00R.
Copes-Vulcan, Inc.: *See—*
Seger, Fritz O., 4,071,586, Cl. 261-62.000.
Copp, Robert M. Machine for use with moving webs. 4,071,178, Cl. 226-39.000.
Corcom, Inc.: *See—*
Burnett, Ronald H., 4,071,780, Cl. 307-262.000.
Cornelius, Richard T.: *See—*
Austin, Forrest L.; and Cornelius, Richard T., 4,070,725, Cl. 417-236.
Cornelius Engineering Center, Inc.: *See—*
Austin, Forrest L.; and Cornelius, Richard T., 4,070,725, Cl. 417-236.
Corning Glass Works: *See—*
Messing, Ralph A.; and Yaverbaum, Sidney, 4,071,409, Cl. 195-63.000.
Cortes Garcia, Jose de Jesus. Large foot balls or soccer balls. 4,071,241, Cl. 273-55.00B.
Couch, Terry Lee: *See—*
Stein, Robert George; and Couch, Terry Lee, 4,071,533, Cl. 260-332.500.
County of Santa Clara, State of California: *See—*
Kinkead, Jordan A.; Pott, James T.; Sherman, Roger M.; and Sullivan, Eugene F., 4,071,152, Cl. 214-75.00R.
Courbot, Pierre; and Meyer, Yves, to Societe Anonyme D.B.A. Automatic adjusting device for a drum brake. 4,071,123, Cl. 188-331.000.
Covic, John; and McBride, Thomas R., to Ohio-Nuclear, Inc. Shutters for X-ray scanners. 4,071,771, Cl. 250-505.000.
Cox, Denis Charles, to Black and Decker Manufacturing Company, The. Field subassembly for electric motors. 4,071,793, Cl. 310-71.000.
Cox, Jerome R., Jr.: *See—*
Brunnett, Carl J.; Cox, Jerome R., Jr.; Snyder, Donald L.; and Mattson, Rodney A., 4,071,769, Cl. 250-445.00T.
Crabb, Elmer Ray, to Caterpillar Tractor Co. Door hold-back apparatus. 4,071,129, Cl. 292-246.000.
Crane, Jacob: *See—*
Cheskis, Harvey P.; Shapiro, Stanley; and Crane, Jacob, 4,071,359, Cl. 75-160.000.
Creusot-Loire: *See—*
Droin, Rene Henri, 4,071,083, Cl. 165-173.000.
Crewse, John L., to Cleveland Vibrator Company, The. Springless impactor. 4,070,947, Cl. 91-39.000.
Crouch, Donald Wayne; and Nelson, Robert Wayne, to General Electric Company. Vacuum-type circuit interrupter with means for protecting its bellows against mechanical damage. 4,071,727, Cl. 200-144.00B.
Croup, Robert E., to Acoustic Fiber Sound Systems, Inc. Weatherproof loudspeaker assembly and method of making same. 4,071,111, Cl. 181-149.000.
Crucea, Ronald D.: *See—*
Sternby, Arthur J.; and Crucea, Ronald D., 4,071,193, Cl. 239-11.000.
Crumpton, Charles H. Loom picker. 4,071,049, Cl. 139-159.000.
CTS Corporation: *See—*
Robinson, James H., 4,070,752, Cl. 29-630.00B.
Cunningham, Ernest Ray, to Grip-Pak, Inc. Assembly machine for interconnected carrier devices. 4,070,850, Cl. 53-48.000.
Curtiss-Wright Corporation: *See—*
Loyd, Robert W., Jr., 4,070,995, Cl. 123-8.110.
Cyphelly, Ivan Jaroslav. Hydraulic apparatus including rotary valve. 4,070,950, Cl. 91-487.000.

Czerepinski, Ralph G.: *See—*
Garrett, Walter L.; and Czerepinski, Ralph G., 4,071,485, Cl. 260-17.00R.

Daicel, Ltd.: *See—*
Katayama, Sakae; Kanada, Sadaoki; Kamata, Michitake; Sakaguchi, Yasuhiro; and Kojima, Katsumi, 4,071,445, Cl. 210-23.00H.

Daigle, Donald J.: *See—*
Pepperman, Armand B., Jr.; Daigle, Donald J.; and Vail, Sidney L., 4,071,501, Cl. 260-67.00R.

Daimler-Benz Aktiengesellschaft: *See—*
Hack, Albert; and Faix, Heinz, 4,071,273, Cl. 296-28.00R.
von Koch, Arwed, 4,070,928, Cl. 74-863.000.

Daiwa Kogyo Co., Ltd.: *See—*
Susai, Sadao, 4,071,641, Cl. 427-234.000.

Dalton, Edgar Terry: *See—*
James, Arthur M.; and Dalton, Edgar Terry, 4,070,836, Cl. 52-245.000.

Dalton, Sally Elizabeth; Gingell, William George; Jenkins, David Conwil; King, Leslie George; Lee, Glyn Evan; and Thompson, Garth Molesdale, to May & Baker Limited. Certain thiazolidine and tetrahydrothiazine compounds. 4,071,528, Cl. 260-306.70T.

Dalton, Thomas B.; Pyatt, Theodore Wayne; and Oosterhouse, Michael Jay, to Westran Corporation. Pivotal and detachable truck body system. 4,071,274, Cl. 296-35.00A.

Daly, Thomas C.; Hepworth, Edward C.; and Means, Rodney J., to Motorola, Inc. Synchronous serial data adaptor. 4,071,887, Cl. 364-200.000.

Danescu, Septimius. Adjustable wall structure. 4,070,808, Cl. 52-122.000.

Danfoss A/S: *See—*
Jensen, Arne, 4,071,900, Cl. 364-600.000.

Daniel, Peter, to Inventio AG. Automatic adjustment apparatus for a friction brake. 4,071,121, Cl. 188-196.00P.

Darby, William L.; Monz, Robert H.; and Molis, Stephen J., to General Electric Company. Cooling arrangement for rotor end turns of reverse flow cooled dynamoelectric machines. 4,071,790, Cl. 310-59.000.

Dart, Edward Charles; and Nemcek, Josef, to Imperial Chemical Industries Limited. Photopolymerizable composition. 4,071,424, Cl. 204-159.150.

Data General Corporation: *See—*
Pandeya, Arun K., 4,071,890, Cl. 364-200.000.

Datwyler, Walter F., Jr.: *See—*
Thuren, John B.; Datwyler, Walter F., Jr.; and Phipps, Jack R., 4,071,013, Cl. 123-32.0SP.

Dauberger, George R., to Midland-Ross Corporation. Clamp back spacer for conduit. 4,071,213, Cl. 248-74.00R.

Davidson, Jerry R.; and Friedli, Hans R., to Dow Chemical Company, The. Method and composition for inhibiting the corrosion of metals. 4,071,470, Cl. 252-389.00R.

Davies, Ben, to Dresser Industries, Inc. Magnesite-chrome refractory. 4,071,370, Cl. 106-59.000.

Davis, Dalton M., to Pyramid Enterprises, Inc. Vehicle wheel apparatus. 4,071,280, Cl. 301-65.000.

Davis, Merton Louis, to Du Pont de Nemours, E. I., and Company. Process for making high shrinkage acrylic fibers. 4,071,596, Cl. 264-168.000.

Davis, Robert Curtis; and McRae, Daniel Dix, to Harris Corporation. Coherent phase detector using a frequency discriminator. 4,071,829, Cl. 329-122.000.

Davis, Samuel H. Shrouded pipe wall casting for use with split-clamp couplings. 4,071,267, Cl. 285-64.000.

Davis, Stanley M.: *See—*
Bernstein, Philip; Coffey, James P.; and Davis, Stanley M., 4,071,661, Cl. 429-49.000.

Davydenko, Vladimir Mikhailovich: *See—*
Fidchunov, Leonid Nikolaevich; Balyk, Stanislav Sergeevich; Silka, Adolf Nikolaevich; Kulakov, Nikolai Konstantinovich; Bakhtarov, Leonid Fedorovich; Azimov, Alexandr Abramovich; Davydenko, Vladimir Mikhailovich; Balitsky, Nikolai Vasilievich; Likhogub, Evgeny Petrovich; and Dorfman, Gersh Abramovich, 4,071,414, Cl. 201-40.000.

Debaudringhien, Andre T.: *See—*
Whitney, James C.; Sander, Willy M.; and Debaudringhien, Andre T., 4,071,857, Cl. 360-92.000.

de Cachard, Maurice; Moracchioli, Robert; and Marie, Gerard, to Commissariat a l'Energie Atomique. Method of cold production and devices for the practical application of said method. 4,070,871, Cl. 62-116.000.

DeCaro, Charles J., to Textron Inc. Linear pull setting tool. 4,070,889, Cl. 72-114.000.

Deguchi, Osamu, to NTN Toyo Bearing Co. Ltd. Apparatus for piling apertured articles in stacks for storage. 4,071,149, Cl. 214-6.00P.

del Castillo, Juan M. Optical metronome. 4,070,944, Cl. 84-484.000.

Delles, Judith Archer: *See—*
Broyde, Barret; Delles, Judith Archer; and North, Steven Forrest, 4,071,479, Cl. 260-2.300.

Demarest, Vincent. Fences and noise barriers. 4,071,223, Cl. 256-1.000.

Demas, Christopher L.: *See—*
Grimm, Robert A.; Randen, Neil A.; and Demas, Christopher L., 4,071,554, Cl. 260-558.00H.

DeNigris, Ernest Gerard; and Tutko, Albert John, to Bell Telephone Laboratories, Incorporated; and Western Electric Company, Inc. Unitary fuse clip having a wire wrap terminal. 4,071,290, Cl. 339-258.00F.

Denka Chemical Corporation: *See—*
Kerr, Ralph O.; and Barone, Bruno J., 4,071,539, Cl. 260-346.750.

Dennis, Juanita. Multi-purpose laboratory light box. 4,071,883, Cl. 362-97.000.

De Santis, Charles M., to United States of America, Army. Device for sensing the real part in a complex impedance. 4,071,819, Cl. 324-58.00B.

Design & Manufacturing Corporation: *See—*
Sandvik, Roger H.; and Huebscher, Richard G., 4,070,946, Cl. 91-25.000.
Sobecks, Ronald S., 4,070,859, Cl. 60-530.000.

Dexter, Martin; and Steinberg, David Herbert, to Ciba-Geigy Corporation. Hindered hydroxyphenylalkanoates of thioether isopropanols and stabilized compositions. 4,071,497, Cl. 260-45.85B.

Dey, Arabinda N., to P. R. Mallory & Co. Inc. Electrolyte salt additive. 4,071,664, Cl. 429-194.000.

Dey, Thomas W., to Bausch & Lomb Incorporated. Lighting panel with controlled distribution of polarized light. 4,071,748, Cl. 362-19.000.

Dezelan, Joseph A.: *See—*
Junck, John A.; Dezelan, Joseph A.; Larson, Donald J.; and White, Robert W., 4,071,106, Cl. 180-44.00F.

Diax Corporation: *See—*
Block, Barry, 4,071,838, Cl. 338-47.000.

Dictaphone Corporation: *See—*
Whitney, James C.; Sander, Willy M.; and Debaudringhien, Andre T., 4,071,857, Cl. 360-92.000.

Diggs, Richard E. Dissociation of water into hydrogen and oxygen using solar energy. 4,071,608, Cl. 423-579.000.

DiGiacomo, Philip A. Method of forming walls for pools, waterfalls and the like. 4,070,849, Cl. 52-742.000.

Digital Equipment Corporation: *See—*
Stockebrand, Thomas C.; Doane, Russell C.; and Morganstern, Michael D., 4,071,910, Cl. 364-900.000.

Dill, J. D. Franklin. Wheel toy. 4,070,791, Cl. 46-220.000.

Dillon, Michael Francis, to Flowers, Inc. Plant propagating and shipping device and method. 4,070,793, Cl. 47-67.000.

Diluiso, Arthur A.; and Post Machinery Company, Inc. Apparatus for packing flat articles. 4,070,960, Cl. 100-49.000.

Dines, Jack E., to Jet Research Center, Inc. Shaped charge well perforating apparatus. 4,071,096, Cl. 175-4.600.

Di Sciascio, Nicola; and Vinci, Michele, to Nuovo Pignone S.p.A. Isolation valve affording an absolute tightness towards the exterior and between the seat and the shutting member. 4,071,221, Cl. 251-228.000.

Discount, Bernard. Sulky. 4,071,257, Cl. 280-63.000.

Dittrich, Wolfhart; Heuer, Helmut; Kamm, W. F. G.; Kipp, Thorwald; Luhr, Gerhard; and Poggemeier, Erich, to Eisenwerk Weserhutte AG. Process for punching holes and slots in structural timber. 4,071,637, Cl. 427-12.000.

Dively, Charles R.; and Peterson, R. Kenneth, to Ingersoll-Rand Company. Cutter mounting extension apparatus. 4,071,098, Cl. 175-53.000.

Djuric, Svetislav V., to Genrad Inc. Method of making an electret acoustic transducer. 4,070,741, Cl. 29-25.420.

D'Luhy, Emil A., to Moore Business Forms, Inc. Stubless multi-part assembly. 4,071,142, Cl. 206-629.000.

Dmitrievich, Loschilin Evghenii: *See—*
Santucci, Nicola; Aleksandrovic, Zabotin Aleksandr; Dmitrievich, Loschilin Evghenii; Lvovich, Galperin Aleksandr; and Archakovich, Onikov Eduard, 4,071,053, Cl. 139-436.000.
Santucci, Nicola; Aleksandrovic, Zabotin Aleksandr; Dmitrievich, Loschilin Evghenii; Lvovich, Galperin Aleksandr; Archakovich, Onikov Eduard; Aleksandrovich, Sakharov Boris; and Alekseevich, Borodin Valerian, 4,071,054, Cl. 139-436.000.

Doane, Russell C.: *See—*
Stockebrand, Thomas C.; Doane, Russell C.; and Morganstern, Michael D., 4,071,910, Cl. 364-900.000.

Dobbert, Gerd, to International Standard Electric Corporation. Supply circuit for a television receiver. 4,071,810, Cl. 315-400.000.

Dobbing, Peter Philip; and Kendall, Peter William, to International Research & Development Company Limited. Brush gear for electrical machinery. 4,071,795, Cl. 310-219.000.

Dobkin, Robert C., to National Semiconductor Corporation. Temperature sensor. 4,071,813, Cl. 323-8.000.

Dr. -Ing. Rudolf Hell GmbH: *See—*
Baar, Walter, 4,071,731, Cl. 219-121.0EB.

Dr. Johannes Heidenhain GmbH: *See—*
Nelle, Gunther, 4,070,759, Cl. 33-125.00C.

Doerner, William Allen; and Van Buskirk, Oral R., to Du Pont de Nemours, E. I., and Company. Cascaded two-fluid rotary closed Rankine cycle engine. 4,070,862, Cl. 60-655.000.

Dolfini, Joseph Edward; Slusarchyk, William A.; and Koster, William Henry, to E. R. Squibb & Sons, Inc. 7-α substituted imino 7-β substituted thio cephalosporin derivatives. 4,071,682, Cl. 544-21.000.

Domazer, Hans-Gunter; and Eggert, Horst, to Th. Goldschmidt AG. Vacuum revolving cylindrical furnace. 4,071,229, Cl. 266-173.000.

Donaldson, John Gleason: *See—*
Phillips, Paul Millard; and Donaldson, John Gleason, 4,071,658, Cl. 428-555.000.

Donnelly Mirrors, Inc.: *See—*
Kamerling, Marc A., 4,071,736, Cl. 219-219.000.

Dorer, Casper John, Jr., to Lubrizol Corporation, The. Salts of Mannich bases and derivatives thereof. 4,071,327, Cl. 44-66.000.

Dorfman, Claire. Motorized rolling pin. 4,070,742, Cl. 29-110.500.

Dorfman, Gersh Abramovich: *See—*
Fidchunov, Leonid Nikolaevich; Balyk, Stanislav Sergeevich; Silka, Adolf Nikolaevich; Kulakov, Nikolai Konstantinovich; Bakhtarov, Leonid Fedorovich; Azimov, Alexandr Abramovich; Davydenko, Vladimir Mikhailovich; Balitsky, Nikolai Vasilievich; Likhogub, Evgeny Petrovich; and Dorfman, Gersh Abramovich, 4,071,414, Cl. 201-40.000.

Dotzer, Richard; Hauschildt, Hans-Georg; Todt, Enno, deceased; by Todt, Susanne, heir; by Todt, Ruth Katharina, heir; and Todt, Ernst Josef, heir, to Siemens Aktiengesellschaft. Method for the preparation of additives in organo-aluminum electrolyte media. 4,071,526, Cl. 260-299.000.

Dow Chemical Company, The: *See—*
Davidson, Jerry R.; and Friedli, Hans R., 4,071,470, Cl. 252-389.00R.
Garner, Joseph L., 4,071,666, Cl. 526-1.000.
Garrett, Walter L.; and Czerepinski, Ralph G., 4,071,485, Cl. 260-17.00R.
Goralski, Christian T., 4,071,547, Cl. 260-456.00R.
Gross, James R., 4,071,650, Cl. 428-260.000.
Jankowiak, Erwin M., 4,071,400, Cl. 162-169.000.
Morgan, Charles W., 4,070,719, Cl. 5-355.000.
Muench, Terry G., 4,071,521, Cl. 260-290.0HL.
Pearce, Roscoe L., 4,071,602, Cl. 423-243.000.
Schuster, Albert J., Jr.; and Martin, John, 4,071,684, Cl. 544-182.000.
Sinke, Gerard C., 4,071,328, Cl. 44-1.00R.
Steinhauer, Alfred F., 4,071,463, Cl. 252-103.000.

Dow Corning Corporation: *See—*
Falender, James R.; Mettler, Claudia M.; and Saam, John C., 4,071,577, Cl. 260-827.000.
Frye, Cecil L.; and Klosowski, Jerome M., 4,071,498, Cl. 260-46.50G.
Plueddemann, Edwin P., 4,071,546, Cl. 260-448.20N.

Drdlik, Frank J. Contact lens applicator. 4,071,272, Cl. 294-1.0CA.

Dresser Industries, Inc.: *See—*
Davies, Ben, 4,071,370, Cl. 106-59.000.

Droin, Rene Henri, to Creusot-Loire. Tubular exchanger. 4,071,083, Cl. 165-173.000.

Drummond, James E.: *See—*
Kolb, Alan C.; and Drummond, James E., 4,071,334, Cl. 55-2.000.

Dufour, Claude. Soluble salts containing sulphur. 4,071,517, Cl. 260-253.000.

Duncan, Angus Dougal, to Pilkington Brothers Limited. Apparatus for cutting or scoring sheet material. 4,070,936, Cl. 83-12.000.

Dunham, James M. Fish receiving hopper. 4,070,786, Cl. 43-55.000.

Dunkerley, Fred J.; Gaudino, Albert J.; and Vilyus, Robert P., to Cleveland Metal Abrasive, Inc. Steel abrasive materials. 4,071,381, Cl. 148-36.000.

Dunlop Limited: *See—*
Lees, Geoffrey; and Katekhda, Izzed-Din, 4,070,903, Cl. 73-38.000.

Dunn, John P. Electrostatic metering device. 4,071,169, Cl. 222-76.000.

Du Pont de Nemours, E. I., and Company: *See—*
Bacher, Rudolph John, 4,071,881, Cl. 361-320.000.
Blackwell, John, 4,071,312, Cl. 8-7.000.
Collier, John R.; and Pilette, Yvan P., 4,071,367, Cl. 96-79.000.
Davis, Merton Louis, 4,071,596, Cl. 264-168.000.
Doerner, William Allen; and Van Buskirk, Oral R., 4,070,862, Cl. 60-655.000.
Garth, Bruce Hollis, 4,071,665, Cl. 429-197.000.

Dupuis, Jean Marcel, to Northern Telecom Limited. Apparatus for preforming wire leads and alignment for bonding. 4,071,180, Cl. 228-1.00R.

Durden, John Apling, Jr., to Union Carbide Corporation. 2-Oximinotetrahydro-1,4-thiazin-5-one compounds and pesticidal carbamate derivatives. 4,071,627, Cl. 424-246.000.

Dyer, William W.: *See—*
Miller, Ralph H., Jr.; Dyer, William W.; Waterbury, John A.; Carlson, Wayland A.; and Eastman, Richard O., 4,071,705, Cl. 179-15.0BA.
Miller, Ralph H., Jr.; Dyer, William W.; Waterbury, John A.; Carlson, Wayland A.; and Eastman, Richard O., 4,071,826, Cl. 325-39.000.

Dynamit Nobel Aktiengesellschaft: *See—*
Stark, Ernst-Joachim; Vanhaiden, Peter; and Klinkenberg, Herbert, 4,071,495, Cl. 260-42.180.

E. R. Squibb & Sons, Inc.: *See—*
Dolfini, Joseph Edward; Slusarchyk, William A.; and Koster, William Henry, 4,071,682, Cl. 544-21.000.

E-Systems, Inc.: *See—*
Pickles, Sidney, 4,071,847, Cl. 343-761.000.

Eales, David Frank, to British Gas Corporation. Coal gasification plant. 4,071,329, Cl. 48-62.00R.

Earle, Ronald A., to Aircraft Inspections. Tool for resetting aircraft spark plug gap. 4,070,898, Cl. 72-409.000.

Early, Judson Horace: *See—*
Off, Joseph W. A.; and Early, Judson Horace, 4,070,937, Cl. 83-27.000.

Easterling, Gene B., to Caterpillar Tractor Co. Motorgrader implement mounting arrangement. 4,071,090, Cl. 172-788.000.

Eastman, Richard O.: *See—*
Miller, Ralph H., Jr.; Dyer, William W.; Waterbury, John A.; Carlson, Wayland A.; and Eastman, Richard O., 4,071,705, Cl. 179-15.0BA.
Miller, Ralph H., Jr.; Dyer, William W.; Waterbury, John A.; Carlson, Wayland A.; and Eastman, Richard O., 4,071,826, Cl. 325-39.000.

Eastwood, Barry John: *See—*
Pratt, George Christopher; Eastwood, Barry John; Michael, Anthony Dennis; and Heath, Leonard, 4,071,643, Cl. 427-292.000.

Eckert, Terry T.; and McDonough, Edward C., to United States of America, Navy. Means for cooling exhaust nozzle sidewalls. 4,071,194, Cl. 239-127.300.

Economics Laboratory, Inc.: *See—*
Kuhns, Garrett D.; Astorp, Norman E.; Mullen, Richard V.; and Thomas, John Ellwood, 4,071,195, Cl. 239-289.000.

Economides & Goldberg: *See—*
Economides, Leander, 4,071,082, Cl. 165-101.000.

Economides, Leander, to Economides & Goldberg. Conversion of a dual duct, dual temperature air conditioning system to a single temperature system. 4,071,082, Cl. 165-101.000.

Edelman, Robert: *See—*
Thomas, Norman W.; Berardinelli, Frank M.; and Edelman, Robert, 4,071,503, Cl. 260-75.00N.

Edmonds, James T., Jr., to Phillips Petroleum Company. Arylene sulfide polymer purification. 4,071,509, Cl. 260-79.000.

Edney, Willie C. Dual purpose home medical bed. 4,070,720, Cl. 5-62.000.

Edon, Guy, to Compagnie Honeywell Bull. Apparatus for marking documents. 4,070,966, Cl. 101-269.000.

Edwards, Walter William. Thumb trigger and automatic safety. 4,070,783, Cl. 42-69.00R.

Efdyn Corporation: *See—*
Schupner, Willard J., 4,071,122, Cl. 188-285.000.

Eggers, George H., to General Atomic Company. Method of making ZrH fuel element. 4,071,587, Cl. 264-.500.

Eggert, Horst: *See—*
Domazer, Hans-Gunter; and Eggert, Horst, 4,071,229, Cl. 266-173.000.

Ehrmann, Karl: *See—*
Kalippke, Harald; Gerber, Richard; and Ehrmann, Karl, 4,071,792, Cl. 310-70.00R.

Eichelberger, Edward Baxter; and Williams, Thomas Walter, to International Business Machines Corporation. Reduced overhead for clock testing in a level system scan design (LSSD) system. 4,071,902, Cl. 364-716.000.

Eicher, Walter, to Contraves AG. Self-adjusting regulation system. 4,071,886, Cl. 364-118.000.

Eigenmann, Ludwig. Method and devices for road surface marking. 4,071,384, Cl. 156-71.000.

Einhorn, Ruediger, to Coats & Clarke, Inc. Wall bracket assembly. 4,071,216, Cl. 248-290.000.

Eisai Co., Ltd.: *See—*
Yoshizawa, Masayuki, 4,071,410, Cl. 195-66.00R.

Eisenberg, Eli; Altmann, Gideon; Bogokovsky, Bianca; and Lapidot, Mordechai, to State of Israel and Isorad Isotope and Radiation Enterprise, Ltd., The. Ready made sterilized culture media and process of preparation. 4,071,412, Cl. 195-102.000.

Eisenwerk Weserhutte AG: *See—*
Dittrich, Wolfhart; Heuer, Helmut; Kamm, W. F. G.; Kipp, Thorwald; Luhr, Gerhard; and Poggemeier, Erich, 4,071,637, Cl. 427-12.000.

Ejiri, Kazushige, to Alps Motorola, Inc. Cartridge ejection preventing device. 4,071,858, Cl. 360-93.000.

Eke, Anna: *See—*
Kalman, Erika; Haklik, Lajos; Eke, Anna; and Kovacs, Pal, 4,071,766, Cl. 250-443.000.

Ekstedt, Edward E.: *See—*
Stenger, Richard E.; Ekstedt, Edward E.; Richey, John M.; and Seto, Stanford P., 4,070,826, Cl. 60-39.660.

Electro-Voice, Incorporated: *See—*
Keele, D. Broadus, Jr., 4,071,112, Cl. 181-187.000.

Elitex - Zavody textilniho strojirenstvi generalni reditelstvi: *See—*
Zouhar, Drahomir; Holas, Antonin; and Musil, Ivan, 4,070,874, Cl. 66-177.000.

Elographics, Incorporated: *See—*
Talmage, John E.; and Bates, L. Dexter, 4,071,689, Cl. 178-18.000.

Elscint, Ltd.: *See—*
Shinitzky, Meir; and Bruck, Abraham, 4,071,770, Cl. 250-461.00B.

Elze, Karl H. Spring loaded cam lock. 4,070,844, Cl. 52-584.000.

Emain, Jean. Polishing wheels. 4,070,798, Cl. 51-361.000.

Emerson, Reginald Stanley, to Leslie Hartridge Limited. Fuel delivery meter. 4,070,907, Cl. 73-119.00A.

Emhart Industries, Inc.: *See—*
Alexander, Gordon A., 4,071,270, Cl. 292-169.220.

EMI Limited: *See—*
LeMay, Christopher Archibald Gordon, 4,071,760, Cl. 250-363.00S.

Emmons, William D.; Nyi, Kayson; and Sperry, Peter R., to Rohm and Haas Company. Coating compositions from dicyclopentenyl acrylate and/or methacrylate. 4,071,489, Cl. 260-22.0CB.

Energy Absorption Systems, Inc.: *See—*
Walker, Grant W., 4,071,599, Cl. 264-311.000.

Energy Development Associates: *See—*
Hart, Thomas G., 4,071,660, Cl. 429-15.000.

Engdahl, Jean: *See—*
Zumsteg, Alphonse Ernst; Engdahl, Jean; and Huguenin, Raymond, 4,071,797, Cl. 310-361.000.

Engelbrecht, Hans, to Shimoda, Sadao. Heat-storage unit and system. 4,071,079, Cl. 165-48.000.
Engelhard, Philippe; Weisang, Joseph Edouard; and Paris, Guy, to Compagnie Francaise de Raffinage. Catalysts for the hydrotreatment of hydrocarbons and a process for the preparation and utilization thereof. 4,071,437, Cl. 208-137.000.
Engelhardt, Edward L.; and Christy, Marcia E., to Merck & Co., Inc. Arylperfluoroalkanes. 4,071,570, Cl. 260-649.00F.
Engels, Mathijs Maria Johannes, to Maatschappij van Berkel's Patent N.V. Weighing apparatus. 4,070,900, Cl. 73-1.00B.
Envall, Lennart Olof Gunnemar: *See*—
Wilton, Inga Elna Maria; Envall, Lennart Olof Gunnemar; Sundstroem, Kurt Lage; and Moran, David Patrick Joseph, 4,071,634, Cl. 426-604.000.
Ermel, Heinrich; Fruth, Franz; Fryda, Georg; Lang, Peter; Rau, Fritz; and Vossnacke, Jurgen, to AGFA-Gevaert, AG. Electrostatic-copier cleaning device. 4,071,296, Cl. 355-15.000.
Ernest, David A., to Allis-Chalmers Corporation. Vehicle wheel suspension system. 4,071,259, Cl. 280-95.00R.
Ernst Leitz GmbH: *See*—
Leitz, Ludwig; Heitmann, Knut; Schneider, Eckart; and Schaefer, Klaus Dieter, 4,071,297, Cl. 356-4.000.
Leitz, Ludwig; Heitmann, Knut; and Schmidt, Horst, 4,071,772, Cl. 250-558.000.
Ernster, Peter Jacob; Collins, William Joseph; and Schaefer, George Henry, to Oster Corporation. Multi-purpose kitchen appliance. 4,071,789, Cl. 310-50.000.
Errington, Paul Anthony, to Morgan Refractories Limited. Refractory insulation. 4,071,311, Cl. 432-234.000.
ESB Incorporated: *See*—
Bernstein, Philip; Coffey, James P.; and Davis, Stanley M., 4,071,661, Cl. 429-49.000.
Escher Wyss G.m.b.H.: *See*—
Bubik, Alfred; Reutter, Siegfried; Schultz, Hans-Joachim; and Stotz, Wolf-Gunter, 4,071,401, Cl. 162-300.000.
Essex Group, Inc.: *See*—
Szudarek, Robert G., 4,071,289, Cl. 339-17.00F.
Estreicher, Isabelle E.; and Price, James B., to Motorola, Inc. Silicon metallographic etch. 4,071,397, Cl. 156-662.000.
Euracom S.A.: *See*—
Apellaniz, Ramon, 4,071,157, Cl. 215-252.000.
Evans, Bryce B., to Aeroquip Corporation. Filter unit having a constant rate purging cycle. 4,071,337, Cl. 55-212.000.
Evans, George S.; and Skwirut, Henry, to Westinghouse Electric Corporation. Method of implanting an amalgamative metal in a fluorescent lamp during manufacture. 4,071,288, Cl. 316-19.000.
Evans, Joseph H.; and Wolfe, Richard B., to Raychem Corporation. Method for covering an article with a recoverable sleeve. 4,070,746, Cl. 29-450.000.
Evans, William Price; and Naik, Appayya Raghunath, to Lever Brothers Company. Detergent composition. 4,071,523, Cl. 260-293.760.
Ewers, Marion H., to Air Rotor Development Company, Inc. Orthopedic arm sling. 4,071,022, Cl. 128-94.000.
Exner, Fritz: *See*—
Bauer, Kurt; Molleken, Reiner; and Exner, Fritz, 4,071,564, Cl. 260-613.00D.
Exxon Research & Engineering Co.: *See*—
Behrmann, William C.; and Caulk, Robert H., 4,071,576, Cl. 260-683.470.
Ezoe, Mitsuhiko, to Nissan Motor Co., Ltd. Power steering control with damping action against rapid change in vehicle speed. 4,071,109, Cl. 180-143.000.
Fachbach, Heinz: *See*—
Skatsche, Othmar; Thien, Gerhard; and Fachbach, Heinz, 4,071,008, Cl. 123-198.00E.
Facom: *See*—
Caroff, Yves Robert, 4,070,915, Cl. 73-487.000.
Faix, Heinz: *See*—
Hack, Albert; and Faix, Heinz, 4,071,273, Cl. 296-28.00R.
Falconer, David G., to Stanford Research Institute. Laser Raman/-fluorescent device for analyzing airborne particles. 4,071,298, Cl. 356-73.000.
Falender, James R.; Mettler, Claudia M.; and Saam, John C., to Dow Corning Corporation. Toughened mercaptosiloxane modified emulsion polymerized vinylic polymers. 4,071,577, Cl. 260-827.000.
Falk, Jerry L., to GTE Sylvania Incorporated. Reversible current apparatus. 4,071,879, Cl. 361-245.000.
Farber, Gerald, to United States of America, Energy. Vibratory high pressure coal feeder having a helical ramp. 4,071,151, Cl. 214-35.00R.
Farge, Daniel: *See*—
Berger, Christian; Farge, Daniel; Gros, Georges; Messer, Mayer Naoum; and Moutonnier, Claude, 4,071,531, Cl. 260-327.00P.
Farinon Electric of Canada Ltd.: *See*—
Beaupre, Donald M.; and Ferris, Harold A., 4,071,711, Cl. 179-41.00A.
Farrington, Grant M.; Harris, J. Donald; and Foessel, Alfred H., to General Refractories Company. Process for making a pitch impregnated, cold molded refractory article. 4,071,593, Cl. 264-62.000.
Fas-Line Sales and Rentals, Inc.: *See*—
Sneed, Robert C.; and Young, Joseph C., 4,071,203, Cl. 242-86.600.
Faulkner, Alfred H. Electronic organ keying system. 4,070,943, Cl. 84-1.010.
Fehrer, Ernst. Machine for spinning textile fibers. 4,070,811, Cl. 57-50.000.
Feierabend, Louis Bock; and Proper, David Staples, to International Business Machines Corporation. Assembling flexible disk record structures. 4,071,869, Cl. 360-135.000.
Feldberg, Murray: *See*—
O'Rourke, James; and Feldberg, Murray, 4,070,961, Cl. 100-185.000.
Ferdinand Aufschlager KG.: *See*—
Ingerle, Kurt; and Meister, Karl, 4,071,087, Cl. 166-278.000.
Ferguson, Thomas W. Demountable practice device attachable to the strings of a stringed racquet. 4,071,239, Cl. 273-29.00A.
Ferland, Jean-Marie; Laliberte, Real; Lippmann, Wilbur; and Pugsley, Thomas A., to Ayerst McKenna and Harrison Ltd. Aryloxy aminobutanols, their preparation and use thereof. 4,071,552, Cl. 260-501.170.
Ferranti Limited: *See*—
Brown, Kenneth Robson; and Kerr, Andrew Guy, 4,070,800, Cl. 52-1.000.
Ferris, Harold A.: *See*—
Beaupre, Donald M.; and Ferris, Harold A., 4,071,711, Cl. 179-41.00A.
Fey, Maurice G.; Wolf, Charles B.; Martin, Paul E.; and Harvey, Francis J., II, to Westinghouse Electric Corporation. Process for production of magnetite spheres with an arc heater. 4,071,588, Cl. 264-15.000.
Fichot, Bernard: *See*—
Bijon, Paul; Fichot, Bernard; and Lainez, Lucien, 4,071,854, Cl. 358-128.000.
Fidchunov, Leonid Nikolaevich; Balyk, Stanislav Sergeevich; Silka, Adolf Nikolaevich; Kulakov, Nikolai Konstantinovich; Bakhtarov, Leonid Fedorovich; Azimov, Alexandr Abramovich; Davydenko, Vladimir Mikhailovich; Balitsky, Nikolai Vasilievich; Likhogub, Evgeny Petrovich; and Dorfman, Gersh Abramovich. Method of smokeless charging of coke ovens with coal charge and coal-charging machine for effecting same. 4,071,414, Cl. 201-40.000.
Fidi, Werner; and Moser, Horst, to AKG Akustische u. Kino-Gerate Gesellschaft m.b.H. Headphone earpiece. 4,071,717, Cl. 179-182.00R.
Fink, Lee. Stilt structure. 4,071,243, Cl. 272-70.100.
Fink, Richard A., to Auburn Foundry, Inc. Walking beam conveyor apparatus and method of operating the same. 4,071,137, Cl. 198-774.000.
Firestone Tire & Rubber Company, The: *See*—
Bethea, Tristram Walker; and Futamura, Shingo, 4,071,492, Cl. 260-31.80R.
Fischer, Artur. Method and arrangement for orienting objects on support structures. 4,070,842, Cl. 52-508.000.
Fischer, Herbert: *See*—
Hiller, Heinz; and Fischer, Herbert, 4,071,607, Cl. 423-574.00R.
Fitch, Robert Herbert: *See*—
Amato, Wayne S.; Bandyopadhyay, Bhaskar; Fitch, Robert Herbert; and Kurtz, Bruce Edward, 4,071,572, Cl. 260-659.00A.
Fives-Cail Babcock: *See*—
Chielens, Alain; and Henin, Jean-Pierre, 4,071,081, Cl. 165-82.000.
Ghestem, Gerard, 4,071,310, Cl. 432-106.000.
Flambeau Paper Company: *See*—
Baierl, Kenneth W., 4,071,398, Cl. 162-15.000.
Flanagan, James Loton; and Webber, Susan Anne, to Bell Telephone Laboratories, Incorporated. Speech signal equalizer. 4,071,695, Cl. 179-1.0VL.
Flanders, Robert L.: *See*—
Blanton, William A., Jr.; and Flanders, Robert L., 4,071,436, Cl. 208-120.000.
Flashner, Michael; and Tanenbaum, Stuart W., to Research Corporation. Neuraminidase. 4,071,408, Cl. 195-62.000.
Fleischer, Donald Whiting, to Veeder Industries, Inc. Rotary electromagnetic indicator system. 4,071,742, Cl. 235-92.0FL.
Fleissner, Hans, to Vepa Aktiengesellschaft. Apparatus for the continuous steaming of textile material of man-made fiber material. 4,070,877, Cl. 68-5.00D.
Florko, Nicholas, Jr. Lug wrench. 4,070,931, Cl. 81-177.00B.
Floryan, Daniel Edwin: *See*—
Cooper, Glenn Dale; and Floryan, Daniel Edwin, 4,071,500, Cl. 260-47.0ET.
Flowers, Inc.: *See*—
Dillon, Michael Francis, 4,070,793, Cl. 47-67.000.
Foessel, Alfred H.: *See*—
Farrington, Grant M.; Harris, J. Donald; and Foessel, Alfred H., 4,071,593, Cl. 264-62.000.
Folsom, Harold A.; and Bilson, David G., to Jervis B. Webb Company. Carrier propelling mechanism for power and free conveyors. 4,070,972, Cl. 104-172.00S.
Fontana, Serge: *See*—
Charransol, Pierre; Hauri, Jacques; and Fontana, Serge, 4,071,702, Cl. 179-15.0AT.
Foote Mineral Company: *See*—
Staggers, John O., 4,071,355, Cl. 75-30.000.
Ford, Edward B., Jr. Thermostatic vent control. 4,071,190, Cl. 236-93.00A.
Ford, George Alan, to Walker-Neer Mfg. Co., Inc. Stabilizer for single or dual tube drilling. 4,071,101, Cl. 175-325.000.
Ford Motor Company: *See*—
Gould, Harry J., 4,071,833, Cl. 333-33.000.
Milberg, Morton E.; and Miller, Wayne M., 4,071,371, Cl. 106-65.000.
Mocarski, Stanislaw, 4,071,354, Cl. 75-.50R.
Ford, Peter W.: *See*—
Frattarola, Joseph R.; and Ford, Peter W., 4,071,741, Cl. 235-436.000.

Forkardt, Gefitec: *See*—
Caprioli, Bruno, 4,070,935, Cl. 82-40.00R.
Forschungsinstitute Bergof GmbH: *See*—
Strathmann, Heinrich, 4,071,590, Cl. 264-45.100.
Foster, Perry A., Jr.; and Jacobs, Stanley C., to Aluminum Company of America. Electrolytic production of metal. 4,071,420, Cl. 204-67.000.
Frahm, James H., to Brunswick Corporation. Throttle and ignition advance linkage for an internal combustion engine. 4,071,002, Cl. 123-99.000.
Frank, Dudley B.: *See*—
Garabedian, Arthur, 4,070,994, Cl. 123-8.070.
Franz Buttner AG.: *See*—
Scherrer, Herbert; Bopp, Ernst; and Cecchetto, Ennio, 4,071,133, Cl. 197-168.000.
Frattarola, Joseph R.; and Ford, Peter W., to UMC Industries, Inc. Card validator. 4,071,741, Cl. 235-436.000.
Frayer, James Albert: *See*—
Yanik, Stephen Joseph; and Frayer, James Albert, 4,071,439, Cl. 208-216.000.
Freda, George B., to Uniroyal, Inc. Gelled gasoline. 4,071,326, Cl. 44-7.00E.
Freda, George B., to Uniroyal, Inc. Latex composition. 4,071,488, Cl. 260-23.70A.
Freisler, Erhard: *See*—
Haltmeier, Paul; Freisler, Erhard; and Rohr, Willy, 4,071,055, Cl. 139-448.000.
French Co., The: *See*—
Wood, Norman E., 4,071,451, Cl. 210-79.000.
Fridman, Eidlya Abramovna: *See*—
Peradze, Tamaz Vladimirovich; Fridman, Eidlya Abramovna; Zheleznova, Nina Vsevolodovna; Kolikov, Vsevolod Mikhailovich; Bresler, Semen Khaimovich-Efimovich; Mchedlishvili, Boris Viktorovich; Molodkin, Viktor Mikhailovich; Molodkina, Ljudmila Mikhailovna; and Katushkina, Nina Vasilievna, 4,071,619, Cl. 424-90.000.
Fried. Krupp Gesellschaft mit beschrankter Haftung: *See*—
Koslowski, Gunter, 4,071,453, Cl. 210-232.000.
Sedlmayer, Franz; Baron, Paul; and Seifert, Klaus, 4,070,868, Cl. 61-91.000.
Fried. Krupp Huttenwerke Ag: *See*—
Grube, Manfred; Gorski, Wilhelm; and Koch, Heinz, 4,070,884, Cl. 72-39.000.
Friederichs, Karl-Heinz: *See*—
Jess, Hans Jurgen; and Friederichs, Karl-Heinz, 4,070,723, Cl. 10-90.000.
Friedli, Hans R.: *See*—
Davidson, Jerry R.; and Friedli, Hans R., 4,071,470, Cl. 252-389.00R.
Friedrich Uhde GmbH: *See*—
Weyer, Horst; Muhlhaus, Ludwig; and Oberschachtsiek, Gerhard, 4,071,612, Cl. 423-659.000.
Friese, Gunther, to Swiss Aluminium Ltd. Device for discharging particulate materials. 4,071,452, Cl. 210-189.000.
Frisch, Rudolf, to Congoleum Corporation. Methods of salvaging improperly processed resinous. 4,071,592, Cl. 264-54.000.
Fruth, Franz: *See*—
Ermel, Heinrich; Fruth, Franz; Fryda, Georg; Lang, Peter; Rau, Fritz; and Vossnacke, Jurgen, 4,071,296, Cl. 355-15.000.
Frutiger, Peter, to Anstalt Europaische Handelsgesellschaft. Method and apparatus for synchronizing a receiver end-key generator with a transmitter end-key generator. 4,071,693, Cl. 178-69.100.
Fryda, Georg: *See*—
Ermel, Heinrich; Fruth, Franz; Fryda, Georg; Lang, Peter; Rau, Fritz; and Vossnacke, Jurgen, 4,071,296, Cl. 355-15.000.
Frye, Cecil L.; and Klosowski, Jerome M., to Dow Corning Corporation. Method of chain extending organosiloxanes. 4,071,498, Cl. 260-46.50G.
Fuji Jukogyo Kabushiki Kaisha: *See*—
Matsuno, Isao, 4,070,999, Cl. 123-32.00B.
Fuji Photo Film Co., Ltd.: *See*—
Ogawa, Hiroshi; Ishii, Kazuhide; Nakamura, Matsuaki; Tamai, Yasuo; and Akashi, Goro, 4,071,654, Cl. 428-336.000.
Takenaka, Haruo; Okiyama, Toshiaki; and Kawamata, Toshio, 4,071,362, Cl. 96-1.400.
Fuji Photo Optical Co., Ltd.: *See*—
Suzuki, Masane; Kanaya, Motonori; and Matsuoka, Takeshi, 4,071,291, Cl. 350-3.500.
Fuji, Saburo: *See*—
Kashiwa, Norio; Fuji, Saburo; and Tanaka, Masahide, 4,071,674, Cl. 526-125.000.
Fujimoto, Sakae, to Ricoh Company, Ltd. Sheet detector in sheet feed station. 4,071,232, Cl. 271-8.00R.
Fujisawa Pharmaceutical Co., Ltd.: *See*—
Kamiya, Takashi; Teraji, Tsutomu Toyonaka; Hashimoto, Masashi; Oku, Teruo Kyoto; Nakaguti, Osamu; Saito, Yoshihisa; and Nakamura, Hitoshi, 4,071,527, Cl. 260-306.500.
Fukai, Masakazu: *See*—
Nagata, Seiichi; Tanaka, Tsuneo; and Fukai, Masakazu, 4,071,383, Cl. 148-175.000.
Fukushima, Masami: *See*—
Yanagisawa, Hiroaki; Ando, Akiko; Fukushima, Masami; and Nakao, Hideo, 4,071,681, Cl. 542-420.000.
Fukuzawa, Akira: *See*—
Nakagawa, Ryuichi; Yoshimatsu, Shiro; Ueda, Takuya; Fukuzawa, Akira; Ozaki, Tsuyoshi; Sato, Akira; and Mitsui, Tatsuro, 4,071,687, Cl. 13-10.000.
Fulenwider, John E.; and Gonsalves, John, to GTE Laboratories Incorporated. Transducer for converting acoustic energy directly into optical energy. 4,071,753, Cl. 250-227.000.
Fulop, Miklos; and Rakar, Geza, to Koolaj es Foldgazbanyaszati Ipari Kutato Laboratorium. Process and apparatus for supersonic drilling in underground rocky strata. 4,071,097, Cl. 175-56.000.
Funke, Manfred Maximilian, to Cincinnati Milacron Inc. Wheel dressing device. 4,071,015, Cl. 125-11.0AT.
Futamura, Shingo: *See*—
Bethea, Tristram Walker; and Futamura, Shingo, 4,071,492, Cl. 260-31.80R.
Gabhart, Terry L.: *See*—
Kitchen, John P.; Gabhart, Terry L.; and Lanham, Jose; L. S., 4,070,717, Cl. 5-176.00R.
Galimov, Anas Galimovich: *See*—
Kilin, Viktor Evdokimovich; Galimov, Anas Galimovich; Yankovsky, Oleg Alexandrovich; Klushin, Nikolai Alexandrovich; and Maslakov, Petr Avramovich, 4,071,094, Cl. 173-139.000.
Gallacci, Joe, to Raymond Lee Organization, Inc., The, a part interest. Mechanical back scratcher. 4,071,021, Cl. 128-52.000.
Ganzel, David K. Large animal convalescent unit. 4,070,989, Cl. 119-27.000.
Garabedian, Arthur, to Frank, Dudley B. Modification for selectively operating a fraction of multiple rotors of a rotary engine. 4,070,994, Cl. 123-8.070.
Garcia, Frank. Multi-story lift device. 4,071,115, Cl. 187-2.000.
Gardner-Denver Company: *See*—
Jameson, James J., 4,071,125, Cl. 192-3.300.
Garner, Joseph L., to Dow Chemical Company, The. Electroconductive resins and intermediates and electroconductive coated paper. 4,071,666, Cl. 526-1.000.
Garrett, Isabel: *See*—
Strongin, Ned; and Garrett, Isabel, 4,070,790, Cl. 46-172.000.
Garrett, Walter L.; and Czerepinski, Ralph G., to Dow Chemical Company, The. Fountain solutions and fountain concentrates for lithographic printing comprising aqueous solutions of polyacrylamide based polymers, and blends of polyacrylamide and polyacrylic acid. 4,071,485, Cl. 260-17.00R.
Garth, Bruce Hollis, to Du Pont de Nemours, E. I., and Company. High energy density battery with dioxolane based electrolyte. 4,071,665, Cl. 429-197.000.
Gartung, Clifford W. Supportive accessory units for modular wall panels. 4,070,803, Cl. 52-36.000.
Gaskins, Justin: *See*—
Steinke, James Marion; and Gaskins, Justin, 4,071,132, Cl. 197-168.000.
Gaudino, Albert J.: *See*—
Dunkerley, Fred J.; Gaudino, Albert J.; and Vilyus, Robert P., 4,071,381, Cl. 148-36.000.
Gaylord, Norman G., to Champion International Corporation. Compatibilization of hydroxyl-containing fillers and thermoplastic polymers. 4,071,494, Cl. 260-42.140.
Gebr. Pfeiffer AG: *See*—
Schauer, Siegfried, 4,071,441, Cl. 209-144.000.
Geller, Stephen I., to Xerox Corporation. Digital interface system for a printer. 4,071,909, Cl. 364-900.000.
General Atomic Company: *See*—
Eggers, George H., 4,071,587, Cl. 264-.500.
Russell, John L., Jr.; and Potthoff, Robert Edward, 4,071,017, Cl. 126-271.000.
General Binding Corporation: *See*—
Staats, Henry N.; and Wiermanski, Jerome J., 4,070,774, Cl. 40-2.200.
General Cable Corporation: *See*—
Thompson, Walter F.; and Redo, Dennis M., 4,071,150, Cl. 214-16.40R.
General Electric Company: *See*—
Anthony, Thomas R.; and Cline, Harvey E., 4,071,378, Cl. 148-1.500.
Armor, Anthony F.; and Stanwick, Casmer P., 4,071,791, Cl. 310-59.000.
Brandt, Theodore C., 4,071,045, Cl. 137-528.000.
Brennan, Thomas E.; Hartmann, Robert H.; and McCoy, Robert M., 4,070,750, Cl. 29-596.000.
Brown, Richard N., 4,070,956, Cl. 99-304.000.
Carlson, Robert G.; and Harrison, Robert W., 4,071,184, Cl. 228-159.000.
Chang, David R.; and Grisik, John J., 4,071,638, Cl. 427-192.000.
Cogan, Richard M., 4,071,183, Cl. 228-173.00A.
Cooper, Glenn Dale; and Floryan, Daniel Edwin, 4,071,500, Cl. 260-47.0ET.
Crouch, Donald Wayne; and Nelson, Robert Wayne, 4,071,727, Cl. 200-144.00B.
Darby, William L.; Monz, Robert H.; and Molis, Stephen J., 4,071,790, Cl. 310-59.000.
Gowdy, Harold W., 4,070,773, Cl. 38-77.830.
Herman, Charles J., 4,070,728, Cl. 16-134.000.
Kernander, Warren N.; and Van Bennekom, Carl F., 4,071,824, Cl. 324-127.000.
Lange, Kai; Wiesen, Ernest J.; and Woronowicz, Eric M., 4,071,762, Cl. 250-369.000.
Pury, Thomas; Konle, Robert L.; and Sivertsen, Marvin L., 4,071,767, Cl. 250-444.000.
Stenger, Richard E.; Ekstedt, Edward E.; Richey, John M.; and Seto, Stanford P., 4,070,826, Cl. 60-39.660.
Vanfleet, Charles R.; and Ruehr, William C., 4,070,827, Cl. 60-204.000.

Walker, Loren H., 4,071,812, Cl. 363-80.000.
Wright, John H., 4,071,316, Cl. 23-230.00B.

General Electric Company Silicone Products Department: *See*—
Grenoble, Maurice E.; and Goossens, John C., 4,071,644, Cl. 427-302.000.

General Latex and Chemical Corporation: *See*—
Hopkins, Henry S., Jr.; and Vargo, Donald L., 4,071,482, Cl. 260-2.5AJ.

General Mills Chemicals, Inc.: *See*—
Nordgren, Robert, 4,071,467, Cl. 252-316.000.

General Mills, Inc.: *See*—
Lindl, Willibald M.; Klande, James R.; and VanHulle, Glenn J., 4,071,635, Cl. 426-264.000.

General Motors Corporation: *See*—
Beiswenger, David W., 4,070,830, Cl. 60-290.000.
Brock, Eugene W., 4,071,805, Cl. 315-84.000.
Martin, Ronald A.; Ashton, Charles R.; and Watson, Richard D., 4,071,788, Cl. 310-42.000.
Polak, James C., 4,070,927, Cl. 74-765.000.
Schlatter, James C.; and Taylor, Kathleen C., 4,071,600, Cl. 423-213.700.
Schoen, Roy C., 4,071,794, Cl. 310-154.000.
Van House, Robert M., 4,071,283, Cl. 303-114.000.
Winchell, Frank J., 4,071,261, Cl. 280-220.000.

General Refractories Company: *See*—
Farrington, Grant M.; Harris, J. Donald; and Foessel, Alfred H., 4,071,593, Cl. 264-62.000.

Genrad Inc.: *See*—
Djuric, Svetislav V., 4,070,741, Cl. 29-25.420.

Genzling, Claude. Bicycle and information-producing assembly carried thereby. 4,071,892, Cl. 364-424.000.

Gerber, Richard: *See*—
Kalippke, Harald; Gerber, Richard; and Ehrmann, Karl, 4,071,792, Cl. 310-70.00R.

Gersch, Josef; and Wiedemann, Otto, to AGFA-Gevaert, AG. Roll film cassette. 4,071,202, Cl. 242-71.100.

Ghestem, Gerard, to Fives-Cail Babcock. Installation for the manufacture of cement. 4,071,310, Cl. 432-106.000.

Ghirga, Marcello: *See*—
Piccolo, Luigi; Calcagno, Benedetto; Ghirga, Marcello; and Paolinelli, Antonio, 4,071,347, Cl. 71-31.000.

Gibbs, Geraldine L. Plant water trough. 4,070,794, Cl. 47-79.000.

Gibbs, Hyatt McDonald; McCall, Samuel Leverte, Jr.; and Venkatesan, Thirumalai Nallan Chakravarthy, to Bell Telephone Laboratories, Incorporated. Amplifying characteristics of a cavity-enclosed nonlinear medium. 4,071,831, Cl. 330-4.300.

Gifford, Phillip H., II, to Phillips Petroleum Company. Recovery of oil from tar sands. 4,071,434, Cl. 208-11.0LE.

Gilbert, Herbert Allan. Traffic safety control module system. 4,071,224, Cl. 256-64.000.

Gilbu, Agnar, to Owens-Corning Fiberglas Corporation. Cylindrical underground storage tank having particularly shaped end caps. 4,071,161, Cl. 220-18.000.

Gillespie, David M. Fluidically driven turntable. 4,071,252, Cl. 274-39.00R.

Gilmour, Ralph M., to Claude Neon Industries Limited. Display sign. 4,070,779, Cl. 40-575.000.

Gingell, William George: *See*—
Dalton, Sally Elizabeth; Gingell, William George; Jenkins, David Conwil; King, Leslie George; Lee, Glyn Evan; and Thompson, Garth Molesdale, 4,071,528, Cl. 260-306.70T.

Gisser, Henry; and Portnoy, Seymour, to United States of America, Army. Random copolymers of methyl methacrylate and N-octadecyl methacrylate. 4,071,678, Cl. 526-328.000.

Gittleman, Jonathan Isaac: *See*—
Pinch, Harry Louis; Abeles, Benjamin; and Gittleman, Jonathan Isaac, 4,071,426, Cl. 204-192.00F.

Glacier Metal Company Limited, The: *See*—
Pratt, George Christopher; Eastwood, Barry John; Michael, Anthony Dennis; and Heath, Leonard, 4,071,643, Cl. 427-292.000.

Glass Master Corporation: *See*—
Cailey, Ronald J., 4,070,954, Cl. 93-36.900.

Glaverbel-Mecaniver: *See*—
Jacquemin, Francis; Terneau, Robert; and Voiturier, Jean-Pierre, 4,071,649, Cl. 428-215.000.

Globe Ticket Company: *See*—
Austin, Harvey B., Jr., 4,071,201, Cl. 242-55.200.

Gobel, Volker, to Krafft Gobel KG Textilmaschinenbau. Felting apparatus. 4,070,738, Cl. 28-137.000.

Gogulski, Paul. Mobile automated shopping system. 4,071,740, Cl. 235-431.000.

Goldammer, Georg; and Beitzinger, Kurt, to SKF Kugellagerfabriken GmbH. Apparatus for arresting the rotor in an open-end spinning machine. 4,070,814, Cl. 57-89.000.

Goldby, Richard Charles, to Charles Richards Fasteners Limited. Self-locking screw threads. 4,071,067, Cl. 151-22.000.

Goldfarb, Adolph E.; and Benkoe, Erwin. Doll head having two randomly selected movements. 4,071,249, Cl. 273-161.000.

Golonka, Kenneth Anthony: *See*—
Bilczo, Dale Louis; Golonka, Kenneth Anthony; Overman, John Arthur; and Carroll, John Ernest, 4,071,885, Cl. 363-64.000.

Gombas, Laszlo Attila, to Coors Container Company. Apparatus and methods for simultaneously necking and flanging a can body member. 4,070,888, Cl. 72-91.000.

Gomberg, Edward N., to Synair. Hybrid solid filled pneumatic tire. 4,071,386, Cl. 156-113.000.

Gonsalves, John: *See*—
Fulenwider, John E.; and Gonsalves, John, 4,071,753, Cl. 250-227.000.

Goodenough, David J., to United States of America, Health, Education and Welfare. X-ray apparatus with rotationally symmetric Gaussian-like focal spot. 4,071,768, Cl. 250-444.000.

Goodman, Clark: *See*—
Carpenter, Neil L.; and Goodman, Clark, 4,071,278, Cl. 299-5.000.

Goodyear Tire & Rubber Company, The: *See*—
Chung, Daniel A., 4,071,279, Cl. 301-63.0PW.
Hollingshead, William S., 4,071,565, Cl. 260-619.00R.
Korver, Gailerd L., 4,071,504, Cl. 260-75.0EP.
McMullen, Philip B., 4,071,647, Cl. 428-102.000.
Neumeister, Alvin W., 4,070,939, Cl. 83-368.000.
Olsen, Richard J., 4,071,068, Cl. 152-176.000.
Tazuma, James J.; and Zadra, Mario D., 4,071,669, Cl. 526-47.300.

Goof, Sven Karl Lennart. Fluid pressure controlled valve assembly. 4,071,039, Cl. 137-87.000.

Goossens, John C.: *See*—
Grenoble, Maurice E.; and Goossens, John C., 4,071,644, Cl. 427-302.000.

Goralski, Christian T., to Dow Chemical Company, The. 3-Bromo-2,2-bis(bromomethyl)propyl bromomethanesulfonate. 4,071,547, Cl. 260-456.00R.

Gorbik, Anatoly Stepanovicy: *See*—
Zherdev, Anatoly Vasilievich; Yakimenko, Grigory Savvich; Gritsuk, Lev Dmitrievich; Gorbik, Anatoly Stepanovicy; Belkin, Evgeny Grigorievich; Tseluiko, Jury Ivanovich; Gorodetsky, Yakov Izrailievich; Severin, Vasily Fedorovich; and Tolochko, Alexei Ivanovich, 4,071,230, Cl. 266-193.000.

Gordon, David A.: *See*—
Seltzer, Raymond; and Gordon, David A., 4,071,477, Cl. 260-2.00N.

Gorodetsky, Yakov Izrailievich: *See*—
Zherdev, Anatoly Vasilievich; Yakimenko, Grigory Savvich; Gritsuk, Lev Dmitrievich; Gorbik, Anatoly Stepanovicy; Belkin, Evgeny Grigorievich; Tseluiko, Jury Ivanovich; Gorodetsky, Yakov Izrailievich; Severin, Vasily Fedorovich; and Tolochko, Alexei Ivanovich, 4,071,230, Cl. 266-193.000.

Gorshe, Thomas Mathew: *See*—
Mitchell, Richard Patrick; and Gorshe, Thomas Mathew, 4,070,852, Cl. 53-297.000.

Gorski, Theodor; Heinen, Adolf; and Mack, Kurt, to Bayer Aktiengesellschaft. Regulating oxygen input in treatment of effluent. 4,071,443, Cl. 210-7.000.

Gorski, Wilhelm: *See*—
Grube, Manfred; Gorski, Wilhelm; and Koch, Heinz, 4,070,884, Cl. 72-39.000.

Goto, Kenji, to Toyota Jidosha Kogyo Kabushiki Kaisha. Stratified combustion engine with prechamber. 4,071,001, Cl. 123-75.00B.

Gould, Harry J., to Ford Motor Company. Apparatus for coupling coaxial transmission line to rectangular waveguide. 4,071,833, Cl. 333-33.000.

Gould Inc.: *See*—
Lautner, Max E.; and West, Bernard J., 4,071,787, Cl. 310-42.000.

Gourdier, Jean-Francois: *See*—
Senes, Michel; Le Goff, Yannick; and Gourdier, Jean-Francois, 4,071,472, Cl. 252-455.00R.

Gowdy, Harold W., to General Electric Company. Steam iron water valve structure. 4,070,773, Cl. 38-77.830.

Graat, Johannes W., to Smit Nijmegen B.V. Apparatus for producing an inert gas. 4,071,322, Cl. 23-262.000.

Grable, Donovan B.; and Laney, Bill C. Well head sealing system. 4,071,085, Cl. 166-84.000.

Graf, Alban; and Guanella, Gustav, to Patelhold Patentverwertungs- & Elektro-Holding AG. Process and apparatus for improving the utilization of transmisson channels through thinning out sections of the signal band. 4,071,707, Cl. 179-15.55R.

Grafe, Peter: *See*—
Werner, Gerhard; Grafe, Peter; Sattelmeyer, Richard; and Schmelzer, Heinz, 4,071,676, Cl. 526-283.000.

Granberg, Elof; and Olsen, Emil Adolph, to Granberg Industries. Log sawing attachment for a chain saw. 4,070,757, Cl. 30-371.000.

Granberg Industries: *See*—
Granberg, Elof; and Olsen, Emil Adolph, 4,070,757, Cl. 30-371.000.

Grapha-Holding AG: *See*—
Schick, Gunther, 4,071,234, Cl. 271-11.000.

Graves, Thomas M.; and Koundakjian, Theodore H., to Chevron Research Company. Aqueous flowable concentrates of particulate water-insoluble pesticides. 4,071,617, Cl. 424-78.000.

Graves, Thomas W.; and Seiler, Ronald, to Bandag Incorporated. Tire belt removal. 4,071,071, Cl. 157-13.000.

Gray, Gorman D., to Lifetime Carbide Co. Method and product for attaching cutting tips to cutting tools. 4,071,141, Cl. 206-372.000.

Greatbatch, Wilson: *See*—
Mead, Ralph T.; Greatbatch, Wilson; and Rudolph, Frank W., 4,071,662, Cl. 429-178.000.

Green, Harold A.: *See*—
Petrocci, Alfonso N.; Merianos, John J.; and Green, Harold A., 4,071,628, Cl. 424-249.000.

Green, Michael J.; and Shue, Ho-Jane, to Schering Corporation. 7α-Halogeno-3,20-dioxo-1,4-pregnadienes, methods for their manufacture, their use as anti-inflammatory agents, and pharmaceutical formulations useful therefor. 4,071,626, Cl. 424-241.000.

Green, Norman W.: *See—*
Knell, Everett W.; and Green, Norman W., 4,071,432, Cl. 208-8.000.
Greene, Sanford I., to Micro Pneumatic Logic Inc. Fluid switch. 4,071,047, Cl. 137-625.180.
Greenhalgh, Peter Frederick: *See—*
Hildon, Anthony MacDonald; and Greenhalgh, Peter Frederick, 4,071,541, Cl. 260-348.250.
Gregory, Peter J. Restraining device. 4,071,023, Cl. 128-133.000.
Greit, Henry A.: *See—*
Nawracaj, Edward P.; and Greit, Henry A., 4,071,033, Cl. 128-420.00A.
Grenoble, Maurice E.; and Goossens, John C., to General Electric Company Silicone Products Department. Method for rendering flexible sheet material non-adherent. 4,071,644, Cl. 427-302.000.
Gress, Wolfgang: *See—*
Linden, Heinz; Gress, Wolfgang; and Offermann, Wilhelm, 4,071,487, Cl. 260-22.0TN.
Greve, Reinhard Cornelis; and van Luijk, Cornelis Pieter, to U.S. Philips Corporation. Crosspoint switch comprising bistable crosspoints. 4,071,728, Cl. 200-175.000.
Griesshammer, Rudolf; Kirschner, Helmut; and Lechner, Gunther, to Wacker-Chemitronic Gesellshaft fur Elektronic Grundstoffe mbH. Nitrogen-free anionic and non-ionic surfactants in a process for producing a haze-free semiconduct. 4,070,797, Cl. 51-326.000.
Griffin, Horace D., Jr. Trailer hitch apparatus with locking means. 4,071,262, Cl. 280-479.00A.
Griffiths, David H., to PPG Industries, Inc. Method of forming glass fibers. 4,071,339, Cl. 65-3.00R.
Grimm, John Edward, III, to Colgate Palmolive Company. Dentifrice containing encapsulated flavoring. 4,071,614, Cl. 424-49.000.
Grimm, Robert A.; Randen, Neil A.; and Demas, Christopher L., to Ashland Oil, Inc. Method for the preparation of N,N-dialkyl hydrazides. 4,071,554, Cl. 260-558.00H.
Grip-Pak, Inc.: *See—*
Cunningham, Ernest Ray, 4,070,850, Cl. 53-48.000.
Gripsin Industries, Inc.: *See—*
Minton, Abraham, 4,071,374, Cl. 106-189.000.
Grisik, John J.: *See—*
Chang, David R.; and Grisik, John J., 4,071,638, Cl. 427-192.000.
Gritsuk, Lev Dmitrievich: *See—*
Zherdev, Anatoly Vasilievich; Yakimenko, Grigory Savvich; Gritsuk, Lev Dmitrievich; Gorbik, Anatoly Stepanovicy; Belkin, Evgeny Grigorievich; Tseluiko, Jury Ivanovich; Gorodetsky, Yakov Izrailievich; Severin, Vasily Fedorovich; and Tolochko, Alexei Ivanovich, 4,071,230, Cl. 266-193.000.
Gros, Georges: *See—*
Berger, Christian; Farge, Daniel; Gros, Georges; Messer, Mayer Naoum; and Moutonnier, Claude, 4,071,531, Cl. 260-327.00P.
Grosch, Gottlieb W. Concrete well casing with cable hooks embedded therein. 4,070,832, Cl. 52-125.000.
Gross, Fritz A., to Raytheon Company. Harbor radio navigation system. 4,071,845, Cl. 343-113.00R.
Gross, James R., to Dow Chemical Company, The. Films and absorbent articles made from copolymers having a copolymerized crosslinker. 4,071,650, Cl. 428-260.000.
Gross, William G.; Long, Henry A., Jr.; and Yamshak, John R., to Armstrong Cork Company. Edge coating apparatus. 4,070,987, Cl. 118-257.000.
Groves, Charles L., Jr.; and Johnson, Steven J., to Westinghouse Electric Corporation. Power plant speed channel selection system. 4,071,897, Cl. 364-494.000.
Grow, Harlow B. Compression ignition control pressure heat engine. 4,070,998, Cl. 123-26.000.
Grube, Manfred; Gorski, Wilhelm; and Koch, Heinz, to Fried. Krupp Huttenwerke Ag. Process and device for de-scaling elongated metallic bars during continuous forming. 4,070,884, Cl. 72-39.000.
Grunwell, Joyce F.; and Petrow, Vladimir, to Richardson-Merrell Inc. Androst-4-en-19-ones for the enhancement of libido. 4,071,624, Cl. 424-238.000.
Grunwell, Joyce F.; and Petrow, Vladimir, to Richardson-Merrell Inc. 19-Oxygenated-5α-androstanes for the enhancement of libido. 4,071,625, Cl. 424-238.000.
Grzesiak, Anthony J.: *See—*
Burke, James E.; and Grzesiak, Anthony J., 4,071,196, Cl. 239-492.000.
GTE Automatic Electric Laboratories Incorporated: *See—*
Benson, Wayne J.; Torburn, Roy B.; and Tweed, Donald G., 4,071,876, Cl. 361-119.000.
Lee, David Quon; and Rovnyak, Richard Michael, 4,071,709, Cl. 179-18.0HB.
GTE Laboratories Incorporated: *See—*
Fulenwider, John E.; and Gonsalves, John, 4,071,753, Cl. 250-227.000.
GTE Sylvania Incorporated: *See—*
Falk, Jerry L., 4,071,879, Cl. 361-245.000.
Phillips, Paul Millard; and Donaldson, John Gleason, 4,071,658, Cl. 428-555.000.
Guanella, Gustav: *See—*
Graf, Alban; and Guanella, Gustav, 4,071,707, Cl. 179-15.55R.
Guarino, John P.; and McCarty, William H., to Mobil Oil Corporation. Radiation curable coating. 4,071,425, Cl. 204-159.240.
Guidez, Joel; Lecouvreur, Paul; and Roumailhac, Jean, to Commissariat a l'Energie Atomique. Rotary machine having a suspended shaft. 4,071,303, Cl. 415-112.000.
Guillon, Pierre M. M.: *See—*
Chauvin, Raymond; and Guillon, Pierre M. M., 4,071,304, Cl. 427-185.000.
Guinn, David C.; Haggard, Archie K.; and Thomas, John P. Mooring system for floating drilling vessels. 4,070,981, Cl. 114-293.000.
Guinn, David C.; Haggard, Archie K.; and Thomas, John P. Pivotal and releasable rat hole assembly. 4,071,145, Cl. 211-60.00S.
Guise, Geoffrey Bruce, to Commonwealth Scientific and Industrial Research Organization. Polyurea polycarbamoyl sulphonates. 4,071,313, Cl. 8-127.600.
Gulf Research & Development Company: *See—*
Yanik, Stephen Joseph; and Frayer, James Albert, 4,071,439, Cl. 208-216.000.
Gunzel, Rudolph M., Jr.; and Radecki, Tony, to Meiko, Inc. Portable motor driven dusting apparatus. 4,071,170, Cl. 222-193.000.
Gurkov, Konstantin Stepanovich: *See—*
Tkach, Khaim Berkovich; Kostylev, Alexandr Dmitrievich; Tupitsyn, Konstantin Konstantinovich; Gurkov, Konstantin Stepanovich; Klimashko, Vladimir Vasilievich; Rozhkov, Leonid Georgievich; Bondar, Mikhail Jurievich; and Smolyanitsky, Boris Nikolaevich, 4,070,948, Cl. 91-234.000.
Gusev, Alexandr Mikhailovich: *See—*
Kholmogorov, Mikhail Vladimirovich; Katkov, Jury Vasilievich; and Gusev, Alexandr Mikhailovich, 4,070,892, Cl. 72-195.000.
Gutehoffnungshutte Sterkrade A. G.: *See—*
Heinen, Manfred; and Kotzur, Joachim, 4,071,253, Cl. 277-3.000.
Gyro Enterprises (Rotates) Pty. Limited: *See—*
McDonald, William J., 4,070,901, Cl. 73-2.000.
Haag, Paul: *See—*
Aenishaenslin, Werner; Suter, Fritz; Pfeuti, Ulrich; and Haag, Paul, 4,070,965, Cl. 101-228.000.
Haarmann & Reimer Gesellschaft mit beschrankter Haftung: *See—*
Bauer, Kurt; Molleken, Reiner; and Exner, Fritz, 4,071,564, Cl. 260-613.00D.
Haberstroh, Gunter; and Heistermann, Lothar, to Bleiindustrie KG Vorm. Jung & Lindig. Method of manufacturing laminated panels or foils of lead and plastics, especially acrylic acid polyethylene copolymers, and laminated panels or foils obtained thereby. 4,071,391, Cl. 156-325.000.
Hack, Albert; and Faix, Heinz, to Daimler-Benz Aktiengesellschaft. Water discharge, especially for hollow spaces in motor vehicle structures. 4,071,273, Cl. 296-28.00R.
Hafke, Carl; and Kohlen, Rudolf, to Metallgesellschaft Aktiengesellschaft. Process of gasifying solid fuels, particularly coal. 4,071,332, Cl. 48-202.000.
Hagenuk Vormals Neufeldt & Kuhnke GmbH: *See—*
Jess, Hans Jurgen; and Friederichs, Karl-Heinz, 4,070,723, Cl. 10-90.000.
Haggar Company: *See—*
Off, Joseph W. A.; and Early, Judson Horace, 4,070,937, Cl. 83-27.000.
Haggard, Archie K.: *See—*
Guinn, David C.; Haggard, Archie K.; and Thomas, John P., 4,070,981, Cl. 114-293.000.
Guinn, David C.; Haggard, Archie K.; and Thomas, John P., 4,071,145, Cl. 211-60.00S.
Hagin, Faust. Slack adjuster for cam brakes. 4,071,120, Cl. 188-79.50K.
Hague, David P.; Malkani, Dalip T.; Middlemiss, Andrew; and Scholey, Stuart, to British Steel Corporation. Manufacture of metal strip. 4,070,739, Cl. 29-18.000.
Hague International: *See—*
La Haye, Paul G.; and Anderson, Ralph E., 4,070,841, Cl. 52-506.000.
Hajek, Ralph S.: *See—*
Moreno, Emil F.; Hajek, Ralph S.; and Marquardt, Julius F., 4,070,924, Cl. 74-710.500.
Haklik, Lajos: *See—*
Kalman, Erika; Haklik, Lajos; Eke, Anna; and Kovacs, Pal, 4,071,766, Cl. 250-443.000.
Halbich, Frank. One piece container particularly adapted for calculators. 4,071,065, Cl. 150-52.00R.
Hall, B. C. Programmable time varying control system and method. 4,071,745, Cl. 364-104.000.
Hall, James B.: *See—*
Walraven, Thomas A.; Thomas, John G.; and Hall, James B., 4,071,182, Cl. 228-110.000.
Hall, John B.: *See—*
Vinals, Joaquin Francisco; Kiwala, Jacob; Hruza, Denis E., Sr.; Hall, John B.; and Vock, Manfred Hugo, 4,071,034, Cl. 131-17.00R.
Vinals, Joaquin Francisco; Kiwala, Jacob; Hruza, Denis E., Sr.; Hall, John B.; and Vock, Manfred Hugo, 4,071,535, Cl. 260-345.100.
Hall, Leo M., to University of Alabama, The Board of Trustees of the. Novel maltase enzyme produced by a new yeast strain. 4,071,407, Cl. 195-62.000.
Halliburton Company: *See—*
McLaughlin, Homer Charles, 4,070,865, Cl. 61-36.00C.
Halling, Horace P.; and Sadoff, Bernard J., Jr., to Pressure Science Incorporated. Pressure compensated slide joint. 4,071,268, Cl. 285-95.000.
Halling, Horace P.; and Sadoff, Bernard J., Jr., to Pressure Science Incorporated. Flexible piping joint. 4,071,269, Cl. 285-165.000.
Halperin, Levi Ytzhak; Zioni, Dov; and Bennet, David, to Shaare Zedek Hospital. Load cancelling device for conveyance systems. 4,071,116, Cl. 187-29.00R.

Haltmeier, Paul; Freisler, Erhard; and Rohr, Willy, to Ruti Machinery Works Ltd. Inserting carrier for looms with removal of a filling yarn from stationary bobbins. 4,071,055, Cl. 139-448.000.

Hamada, Masa: *See—*
Umezawa, Hamao; Takeuchi, Tomio; Hamada, Masa; Takamatsu, Akira; and Oki, Toshikazu, 4,071,411, Cl. 195-80.00R.

Hamel, Edmund, to Ofa AG. Method of making a core yarn. 4,070,818, Cl. 57-160.000.

Hammond, Thomas J., to Xerox Corporation. Sodium vapor lamp with emission aperture. 4,071,798, Cl. 313-18.000.

Hammond, Thomas J.; and Lama, William L., to Xerox Corporation. Sodium vapor lamp with emission aperture. 4,071,799, Cl. 313-44.000.

Hancock, Loren. Bracing apparatus. 4,070,833, Cl. 52-148.000.

Hand, Gene F., to Clark Equipment Company. Brake and steering system. 4,070,858, Cl. 60-422.000.

Hankin, Ralph L., to Tube Machinery Corporation. Roll former for tube mill. 4,070,887, Cl. 72-52.000.

Hansel, William B., to Suntech, Inc. Programmable manual actuator. 4,071,059, Cl. 141-206.000.

Hanson, Charles M., to United States of America, Army. Automotive accessory engine. 4,070,860, Cl. 60-616.000.

Hanson, Donald O., to Phillips Petroleum Company. Recovery of oil from tar sands. 4,071,433, Cl. 208-11.0LE.

Hanton, Daniel, to Saint-Gobain Industries. Manufacture of phenolic foam. 4,071,481, Cl. 260-2.50F.

Harada, Ietsuya, to Nissan Motor Co., Ltd. Exhaust gas recirculating system. 4,071,006, Cl. 123-119.00A.

Harden, Phillip L., to Bowmar Instrument Corporation. Flat keyboard assembly having cover type membrane with protrusions to align switch components. 4,071,718, Cl. 200-5.00A.

Harnischfeger Corporation: *See—*
Wieschel, John E., 4,071,205, Cl. 242-117.000.

Harris Corporation: *See—*
Davis, Robert Curtis; and McRae, Daniel Dix, 4,071,829, Cl. 329-122.000.

Harris, J. Donald: *See—*
Farrington, Grant M.; Harris, J. Donald; and Foessel, Alfred H., 4,071,593, Cl. 264-62.000.

Harrison, Robert W.: *See—*
Carlson, Robert G.; and Harrison, Robert W., 4,071,184, Cl. 228-159.000.

Hart, John Evans, to Lockheed Corporation. Vehicle control system incorporating a compensator to stabilize the inherent dynamics thereof. 4,071,209, Cl. 244-83.00D.

Hart, Leroy D.: *See—*
Pearson, Alan; and Hart, Leroy D., 4,071,594, Cl. 264-63.000.

Hart, Samuel A.; and Hart, William E. Pincer bucket. 4,071,155, Cl. 214-147.00G.

Hart, Terry Jonathan, to Bell Telephone Laboratories, Incorporated. Latch and switch interlock safety structure. 4,071,722, Cl. 200-50.00A.

Hart, Thomas G., to Energy Development Associates. Electrode for a zinc-chloride battery and batteries containing the same. 4,071,660, Cl. 429-15.000.

Hart, William E.: *See—*
Hart, Samuel A.; and Hart, William E., 4,071,155, Cl. 214-147.00G.

Harthill, William P.; and Roberts, James L., to Honeywell Inc. Quadrature correlation phase determining apparatus. 4,071,821, Cl. 324-83.00R.

Hartmann, Robert H.: *See—*
Brennan, Thomas E.; Hartmann, Robert H.; and McCoy, Robert M., 4,070,750, Cl. 29-596.000.

Hartz, Lewis C., Jr., to United States of America, Army. Washer aligning and placing tool. 4,070,744, Cl. 29-241.000.

Harvey, Francis J., II: *See—*
Fey, Maurice G.; Wolf, Charles B.; Martin, Paul E.; and Harvey, Francis J., II, 4,071,588, Cl. 264-15.000.

Harvey, Robin J., to Hughes Aircraft Company. Crossed-field switch device and method for off-switching. 4,071,801, Cl. 313-154.000.

Hashimoto, Masashi: *See—*
Kamiya, Takashi; Teraji, Tsutomu Toyonaka; Hashimoto, Masashi; Oku, Teruo Kyoto; Nakaguti, Osamu; Saito, Yoshihisa; and Nakamura, Hitoshi, 4,071,527, Cl. 260-306.500.

Hassall, Cedric Herbert; Johnson, William Henry; Krohn, Antonin; Smithen, Carey Ernest; and Thomas, William Anthony, to Hoffmann-La Roche Inc. Substituted phenyl ketones. 4,071,525, Cl. 260-295.0AM.

Hatakeyama, Nobuo: *See—*
Aoki, Katsumichi; Shimizu, Susumu; Satake, Keigo; Yamazaki, Shiro; and Hatakeyama, Nobuo, 4,071,633, Cl. 424-324.000.

Hattori, Hiroyuki: *See—*
Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, 4,071,295, Cl. 355-3.0SH.

Hattori, Torao; and Maezono, Masakazu. Safety apparatus in an automatic transmission for a vehicle to prevent engagement of the low speed clutch at high speeds. 4,071,126, Cl. 192-87.120.

Hauri, Jacques: *See—*
Charransol, Pierre; Hauri, Jacques; and Fontana, Serge, 4,071,702, Cl. 179-15.0AT.

Hauschildt, Hans-Georg: *See—*
Dotzer, Richard; Hauschildt, Hans-Georg; Todt, Enno, deceased; Todt, Susanne, heir; Todt, Ruth Katharina, heir; and Todt, Ernst Josef, heir, 4,071,526, Cl. 260-299.000.

Haver & Boecker: *See—*
Haver, Eitel Fritz, 4,071,455, Cl. 210-497.100.

Haver, Eitel Fritz, to Haver & Boecker. Filter element and method of making the same. 4,071,455, Cl. 210-497.100.

Hawk, Cortez. Fishing line guide device. 4,070,785, Cl. 43-24.000.

Hayashi, Chozo: *See—*
Takahashi, Zyuro; and Hayashi, Chozo, 4,071,413, Cl. 195-103.50R.

Hayashi, Eiichi; Takita, Kiyoshi; Sugiyama, Hironari; and Nezu, Yukio, to Kumiai Chemical Industry Co., Ltd. Process for producing l-ascorbic acid-2-sulfate. 4,071,534, Cl. 260-343.700.

Hayashi, Seijiro: *See—*
Koike, Shin'ichi; Hayashi, Seijiro; and Takayama, Michio, 4,071,827, Cl. 325-42.000.

Hayashi, Shizuo: *See—*
Iijima, Eiji; Watanabe, Hiroshi; and Hayashi, Shizuo, 4,071,475, Cl. 252-545.000.

Hayashi, Yoshimasa: *See—*
Nakajima, Yasuo; and Hayashi, Yoshimasa, 4,071,005, Cl. 123-119.00A.

Hayes, Jeremiah Francis: *See—*
Brophy, Francis Joseph; and Hayes, Jeremiah Francis, 4,071,908, Cl. 364-900.000.

Hazen Research, Inc.: *See—*
Peters, Mark A., 4,071,357, Cl. 75-103.000.

Head, Stanley Maurice; and Melas, Constantine Michael, to International Business Machines Corporation. Autocorrelation function factor generating method and circuitry therefor. 4,071,903, Cl. 364-728.000.

Heath, Leonard: *See—*
Pratt, George Christopher; Eastwood, Barry John; Michael, Anthony Dennis; and Heath, Leonard, 4,071,643, Cl. 427-292.000.

Hechenbleikner, Ingenuin, to Borg-Warner Corporation. Cyclic phosphonates. 4,071,583, Cl. 260-927.00R.

Hedrick, John R., to Pevrick Engineering Company, Inc. Rotatable duraguard. 4,071,030, Cl. 128-310.000.

Heidelberger Druckmaschinen Aktiengesellschaft: *See—*
Zehe, Alfred, 4,070,968, Cl. 101-408.000.

Heidenreich & Harbeck Zweigniederlassung der Gildemeister AG: *See—*
Rose, Peter, 4,071,532, Cl. 264-328.000.

Heikoff, Stanley: *See—*
Palmer, David Nelson; and Heikoff, Stanley, 4,071,639, Cl. 427-156.000.

Heinen, Adolf: *See—*
Gorski, Theodor; Heinen, Adolf; and Mack, Kurt, 4,071,443, Cl. 210-7.000.

Heinen, Manfred; and Kotzur, Joachim, to Gutehoffnungshutte Sterkrade A. G. Gas-sealed shaft packing. 4,071,253, Cl. 277-3.000.

Heistermann, Lothar: *See—*
Haberstroh, Gunter; and Heistermann, Lothar, 4,071,391, Cl. 156-325.000.

Heitmann, Knut: *See—*
Leitz, Ludwig; Heitmann, Knut; Schneider, Eckart; and Schaefer, Klaus Dieter, 4,071,297, Cl. 356-4.000.
Leitz, Ludwig; Heitmann, Knut; and Schmidt, Horst, 4,071,772, Cl. 250-558.000.

Heitner, Raymond J., to Wysong & Miles Company. Press brake with improved ram leveling adjustment. 4,070,896, Cl. 72-389.000.

Helmer, Jack R., to Minnesota Mining and Manufacturing Company. Method for strengthening lithographic printing plate images. 4,070,969, Cl. 101-465.000.

Henderson, Thomas D., to Solar Energy For The Family Inc. Solar energy collecting apparatus. 4,071,016, Cl. 126-270.000.

Henin, Jean-Pierre: *See—*
Chielens, Alain; and Henin, Jean-Pierre, 4,071,081, Cl. 165-82.000.

Henkel KGaA: *See—*
Linden, Heinz; Gress, Wolfgang; and Offermann, Wilhelm, 4,071,487, Cl. 260-22.0TN.

Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA): *See—*
Schwuger, Milan Johann; Smolka, Heinz; Altenschopfer, Theodor; and Rostek, Manfred, 4,071,377, Cl. 134-29.000.

Hensel, Wilber M., Jr., to Sun Oil Company. Method and apparatus for stabilizing borehole cores. 4,071,099, Cl. 175-59.000.

Hepworth, Edward C.: *See—*
Daly, Thomas C.; Hepworth, Edward C.; and Means, Rodney J., 4,071,887, Cl. 364-200.000.

Herbert, Chester L. Double crankshaft valved two cycle engine. 4,071,000, Cl. 123-51.0BD.

Herbster, Terry N.: *See—*
Kaplan, Murray L.; Herbster, Terry N.; and Holden, Alan F., 4,071,708, Cl. 179-16.00E.

Herman, Charles J., to General Electric Company. Vertically adjustable door hinge assembly. 4,070,728, Cl. 16-134.000.

Herrmann, Eric Peter, to RCA Corporation. Four-quadrant multiplier. 4,071,777, Cl. 307-229.000.

Herron, Lorne Robert; and Stromnes, Axel, to Atlas Copco Aktiebolag. Methods of and apparatus for winning reef. 4,071,095, Cl. 173-152.000.

Herubel, Jean Frederic, to Schlumberger & Cie. Textile fibre control system in a drawing device. 4,070,732, Cl. 19-236.000.

Hesse, Ruth Lee: *See—*
Kohnke, Ole Bjorn, 4,071,025, Cl. 128-145.700.

Heuer, Helmut: *See—*
Dittrich, Wolfhart; Heuer, Helmut; Kamm, W. F. G.; Kipp, Thorwald; Luhr, Gerhard; and Poggemeier, Erich, 4,071,637, Cl. 427-12.000.

Hewes, Charles Robert, to Texas Instruments Incorporated. Charge

coupled differential amplifier for transversal filter. 4,071,775, Cl. 307-221.00D.

Hicklin, Denis Raymond; White, Derek Graham Walter; and Attwood, Brian William, to Karl Kroyer St. Anne's Limited. Treatment of fibrous material. 4,071,651, Cl. 428-284.000.

High, Carl E. Puzzle apparatus. 4,071,248, Cl. 273-155.000.

Hijikata, Akiko: *See—*
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,071,621, Cl. 424-177.000.

Hildon, Anthony MacDonald; and Greenhalgh, Peter Frederick, to Interox Chemicals Limited. Epoxidation. 4,071,541, Cl. 260-348.250.

Hiller, Heinz; and Fischer, Herbert, to Metallgesellschaft Aktiengesellschaft. Process for producing sulfur. 4,071,607, Cl. 423-574.00R.

Hinke, Jerald Dietrich: *See—*
Reinhardt, Jack; Moehle, Kenneth Albert; and Hinke, Jerald Dietrich, 4,070,914, Cl. 74-475.000.

Hinkle, Richard E., to American Hydrotherm Corporation. Process and apparatus for the cyclic heating and cooling of processing equipment. 4,071,075, Cl. 165-2.000.

Hirayama, Toshiharu: *See—*
Kobayashi, Seizo; Hirayama, Toshiharu; Kamiya, Takeshi; Kezuka, Seiju; and Takeuchi, Hidesuke, 4,071,591, Cl. 264-45.300.

Hirose, Huminori, to Matsushita Electric Industrial Co., Ltd. Magnetic recording and reproducing system. 4,071,861, Cl. 360-96.000.

Hirsch, Horst E.: *See—*
Charlton, Thomas L.; Redden, Robert F.; Hirsch, Horst E.; and Liang, Shou C., 4,071,422, Cl. 204-105.00R.

Hitachi, Ltd.: *See—*
Aoki, Masataka, 4,071,404, Cl. 176-87.000.
Kawanami, Mitsuru; Ohhinata, Ichiro; and Okuhara, Shinzi, 4,071,779, Cl. 307-255.000.
Kumada, Akio, 4,071,841, Cl. 365-65.000.
Misono, Masayoshi; Koyama, Masaharu; and Asida, Tutomu, 4,070,749, Cl. 29-592.00R.
Miyakawa, Seii; Kobayashi, Takashi; Kishi, Masaya; and Ogiro, Kenji, 4,070,743, Cl. 29-227.000.
Nakagomi, Yoshiyuki, 4,071,778, Cl. 307-229.000.
Nakasuna, Seikoh, 4,071.865, Cl. 360-105.000.
Okayama, Tsutomu, 4,071,823, Cl. 324-123.00R.

Hoechst Aktiengesellschaft: *See—*
Andrascheck, Hans-Joachim; Mucke, Rainer; Lorz, Werner; Borchard, Heinz; Buck, Jurgen; Knothe, Herbert; and Rybka, Bruno, 4,071,490, Cl. 260-23.0XA.
Brinkmann, Ludwig; and Bohn, Lothar, 4,071,506, Cl. 260-78.00A.
Kuhlein, Klaus; Reuschling, Dieter-Bernd; Babej, Milos; Bartmann, Wilhelm; and Beck, Gerhard, 4,071,530, Cl. 260-326.450.
Werner, Gerhard; Grafe, Peter; Sattelmeyer, Richard; and Schmelzer, Heinz, 4,071,676, Cl. 526-283.000.

Hoffman-La Roche, Inc.: *See—*
Cohen, Noal; Rosenberger, Michael; and Saucy, Gabriel, 4,071,537, Cl. 260-345.90S.

Hoffmann-La Roche Inc.: *See—*
Buchi, George, 4,071,542, Cl. 260-348.480.
Christenson, James Gordon; and Muccino, Richard R., 4,071,522, Cl. 260-292.000.
Cook, Alan Frederick, 4,071,680, Cl. 536-23.000.
Hassall, Cedric Herbert; Johnson, William Henry; Krohn, Antonin; Smithen, Carey Ernest; and Thomas, William Anthony, 4,071,525, Cl. 260-295.0AM.
Olson, Gary Lee, 4,071,538, Cl. 260-345.90R.

Hogendobler, Richard Shure; and Murray, Robert Maclay, to AMP Incorporated. Method of making a coaxial connector. 4,070,751, Cl. 29-628.000.

Holas, Antonin: *See—*
Zouhar, Drahomir; Holas, Antonin; and Musil, Ivan, 4,070,874, Cl. 66-177.000.

Holbrook, Franklin K.: *See—*
Bushman, Ronald C.; and Holbrook, Franklin K., 4,070,959, Cl. 99-510.000.

Holden, Alan F.: *See—*
Kaplan, Murray L.; Herbster, Terry N.; and Holden, Alan F., 4,071,708, Cl. 179-16.00E.

Holdt, Donald, to Chemed Corporation. Boiler blow down controller. 4,070,992, Cl. 122-382.000.

Holl Research Corporation: *See—*
Holl, Richard A., 4,071,225, Cl. 366-114.000.

Holl, Richard A., to Holl Research Corporation. Apparatus and processes for the treatment of materials by ultrasonic longitudinal pressure oscillations. 4,071,225, Cl. 366-114.000.

Hollingshead, William S., to Goodyear Tire & Rubber Company, The. Butylated, α-methyl styrenated phenolic antioxidants. 4,071,565, Cl. 260-619.00R.

Hollins, Jesse R. Motor vehicle air conditioner control and warning system. 4,071,839, Cl. 340-53.000.

Hollis, Ernest E., to Sanders Associates, Inc. Digital radar target generator. 4,070,769, Cl. 35-10.400.

Holloway, Arthur John: *See—*
Latham, Raymond John; and Holloway, Arthur John, 4,071,589, Cl. 264-22.000.

Holman, Robert L., to Xerox Corporation. Diffusion crucible and slab member with common metal component in the vapor phase. 4,071,323, Cl. 23-273.00R.

Holman, Robert L., to Xerox Corporation. Controlled atmosphere process for altering the nonstoichiometry of crystalline members. 4,071,396, Cl. 156-612.000.

Holy, Josef K., to Hughes Aircraft Company. System and method for the measurement of repetitive patterns. 4,071,899, Cl. 364-561.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Yoshida, Kazuyoshi, 4,070,925, Cl. 74-720.000.
Yoshimura, Toshimitsu; and Matsuda, Minoru, 4,070,829, Cl. 60-290.000.

Honda, Kazuo: *See—*
Kikumoto, Ryoji; Tobe, Akihiro; Tonomura, Shinji; Ikoma, Hidenobu; and Honda, Kazuo, 4,071,559, Cl. 260-570.700.

Honeywell Inc.: *See—*
Harthill, William P.; and Roberts, James L., 4,071,821, Cl. 324-83.00R.

Honeywell Information Systems Inc.: *See—*
Miller, Homer Warner, 4,071,904, Cl. 364-757.000.

Hoogasian, Harold B. Apparatus for exercising manual coordination. 4,071,237, Cl. 273-1.00R.

Hooker Chemicals & Plastics Corporation: *See—*
Takahashi, Akio, 4,071,582, Cl. 260-878.00R.

Hooker, Donald E., to Bally Manufacturing Corporation. Magnetic reel reading device. 4,071,246, Cl. 273-143.00R.

Hoover Ball and Bearing Co.: *See—*
Kitchen, John P.; Gabhart, Terry L.; and Lanham, Joseph S., 4,070,717, Cl. 5-176.00R.

Hopkins, Henry S., Jr.; and Vargo, Donald L., to General Latex and Chemical Corporation. Reduced-friability, highly cross-linked, flame-resistant, polyurethane foams. 4,071,482, Cl. 260-2.5AJ.

Hopwood, Francis W.; Staley, Lester K.; and Tolj, Henry D., to Westinghouse Electric Corporation. Frequency control for frequency agile pulse radar. 4,071,844, Cl. 343-17.20R.

Horan, Paul F., to VCA Corporation. Cover enclosing flat sided button for actuation prevention. 4,071,173, Cl. 222-321.000.

Hornagold, John T., to Bucyrus-Erie Company. Mounting for an outrigger cylinder on a crane. 4,071,147, Cl. 212-145.000.

Horrocks, Donald L., to Beckman Instruments, Inc. Method for determining random coincidence count rate in a scintillation counter utilizing the coincidence technique. 4,071,761, Cl. 250-369.000.

Horsburgh and Scott Company, The: *See—*
LeBlanc, Wayne J., 4,070,920, Cl. 74-446.000.

Houdaille Industries, Inc.: *See—*
Rutz, Leon E., 4,070,831, Cl. 60-371.000.

Hovmand, Svend; and Liborius, Erik, to Aktieselskabet Niro Atomizer. Process and apparatus for converting a solution or suspension into a dried particulate, granulate product. 4,070,765, Cl. 34-10.000.

Howell, Samuel Garry: *See—*
Miller, Robert W.; and Howell, Samuel Garry, 4,071,656, Cl. 428-626.000.

Howells, George A.: *See—*
Weir, Donald A.; Usher, Eric S.; and Howells, George A., 4,071,692, Cl. 178-68.000.

Hruza, Denis E., Sr.: *See—*
Vinals, Joaquin Francisco; Kiwala, Jacob; Hruza, Denis E., Sr.; Hall, John B.; and Vock, Manfred Hugo, 4,071,034, Cl. 131-17.00R.
Vinals, Joaquin Francisco; Kiwala, Jacob; Hruza, Denis E., Sr.; Hall, John B.; and Vock, Manfred Hugo, 4,071,535, Cl. 260-345.100.

Hubbard, S. Eugene, to Kawneer Company, Inc. Sloped curtain wall structure. 4,070,806, Cl. 52-95.000.

Hueber, Herman Pieter: *See—*
Bretschneider, Hermann; Hueber, Herman Pieter; and Louzil, Friedrich, 4,071,716, Cl. 179-100.1DR.

Huebscher, Richard G.: *See—*
Sandvik, Roger H.; and Huebscher, Richard G., 4,070,946, Cl. 91-25.000.

Huffman, Charles E.; McGuire, Robert J.; and Waddill, John W., to Rockwell International Corporation. Testing apparatus. 4,071,700, Cl. 179-15.0BF.

Huggett, Ralph, to TBA Industrial Products Limited. Yarn manufacturing. 4,070,816, Cl. 57-153.000.

Hughes Aircraft Company: *See—*
Harvey, Robin J., 4,071,801, Cl. 313-154.000.
Holy, Josef K., 4,071,899, Cl. 364-561.000.
Oltman, Henry G., Jr., 4,071,846, Cl. 343-700.0MS.
Somogyi, Bela, 4,070,821, Cl. 58-23.0BA.

Huguenin, Raymond: *See—*
Zumsteg, Alphonse Ernst; Engdahl, Jean; and Huguenin, Raymond, 4,071,797, Cl. 310-361.000.

Humphrey, Frederick Harold. Typing error correction device. 4,071,134, Cl. 197-181.000.

Hunt, Harold R.: *See—*
Kraus, Gerard; and Hunt, Harold R., 4,071,496, Cl. 260-42.360.

Hunter, William Ward, Jr., to Abbott Laboratories. Stabilized alcohol solution of reducing salt formulations for use in preparing radioisotope labeled scanning agents: liver scanning technetium-99m colloid and method of preparation. 4,071,613, Cl. 424-1.000.

Huntington, Robert Charles, to Motorola, Inc. Complementary field effect transistor linear amplifier. 4,071,830, Cl. 330-277.000.

Hutter, Charles G., III; and Hutter, Peter S., to Physical Systems, Inc. Air exhausted mixing bowl. 4,071,338, Cl. 55-385.00C.

Hutter, Peter S.: *See—*
Hutter, Charles G., III; and Hutter, Peter S., 4,071,338, Cl. 55-385.00C.

Hutton, Charles M., to Armco Steel Corporation. Tie plate fastener system. 4,071,191, Cl. 238-338.000.

Hwang, Yu-Tang, to Chemplex Company. Catalyst and method. 4,071,673, Cl. 526-123.000.

Hydril Company: *See—*
Mott, James D., 4,071,088, Cl. 166-321.000.
I. P. U. Limited: *See—*
McDonald, Bridget M. A., 4,071,227, Cl. 266-51.000.
Ianetta, Henry Robert. Attachments for golf bags. 4,071,062, Cl. 150-1.50B.
Ibec Industries, Inc.: *See—*
Smith, John L.; and Alexander, Clair B., 4,071,725, Cl. 200-82.00E.
Ichinose, Yoshinobu. Fluorescent lamp lighting device. 4,071,807, Cl. 315-219.000.
Ideal Industries Inc.: *See—*
Oprins, John A. E., 4,070,930, Cl. 81-9.50B.
Ignasiak, Stanley F., to Sperry Rand Corporation. Penetration phosphors for display devices. 4,071,640, Cl. 427-215.000.
Iida, Akio, to Kabushiki Kaisha Komatsu Seisakusho. Steering system for articulated vehicles. 4,071,108, Cl. 180-139.000.
Iida, Toshihide: *See—*
Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, 4,071,295, Cl. 355-3.0SH.
Iijima, Eiji; Watanabe, Hiroshi; and Hayashi, Shizuo, to Kao Soap Co., Ltd. Transparent highly viscous liquid shampoo composition. 4,071,475, Cl. 252-545.000.
Iino, Tsuyoshi, to Kitazawa Shoji Kabushiki Kaisha. Ball valve. 4,071,220, Cl. 251-174.000.
Iizuka, Akira: *See—*
Takahashi, Masaaki; Iizuka, Akira; and Asano, Kiro, 4,071,553, Cl. 260-514.00J.
Ikeda, Sakuji; and Soga, Kazuo, to Tokyo Institute of Technology. Process of preparing polyesters having carbonyl group and ether linkage in the principal chain thereof. 4,071,667, Cl. 526-11.100.
Ikoma, Hidenobu: *See—*
Kikumoto, Ryoji; Tobe, Akihiro; Tonomura, Shinji; Ikoma, Hidenobu; and Honda, Kazuo, 4,071,559, Cl. 260-570.700.
Illinois Tool Works Inc.: *See—*
Anderson, Bruce W., 4,071,696, Cl. 179-1.0PC.
Madland, Robert Christen, 4,071,719, Cl. 200-5.00B.
IMC Chemical Group, Inc.: *See—*
Wehrmeister, Herbert Louis, 4,071,520, Cl. 260-287.00K.
Imperial Chemical Industries Limited: *See—*
Cooke, Brian Alfred; and Brock, Michael, 4,071,379, Cl. 148-6.15Z.
Dart, Edward Charles; and Nemcek, Josef, 4,071,424, Cl. 204-159.150.
Latham, Raymond John; and Holloway, Arthur John, 4,071,589, Cl. 264-22.000.
Imperial Knife Associated Companies, Inc.: *See—*
Burrows, Thomas M.; and Ashton, Harold P., 4,071,212, Cl. 248-37.600.
Indian Head Inc.: *See—*
Robinson, Richard L.; and Volgyesy, Ivan L., 4,071,159, Cl. 220-3.200.
Industrial Industries, Inc.: *See—*
King, Roy R., 4,071,019, Cl. 126-299.00E.
Industriewerk Schaeffler OHG: *See—*
Linz, Leonhard, 4,070,897, Cl. 72-345.000.
Inertia Switch Limited: *See—*
Jackman, Peter Ronald, 4,071,723, Cl. 200-61.45R.
Ingeniera Aplicada, S.A. (INAPSA): *See—*
Nunez Fuentes, Cayetano, 4,070,918, Cl. 74-70.000.
Ingenieria Aplicada, S.A.: *See—*
Camprubi, Amselmo Bolea, 4,071,056, Cl. 139-449.000.
Ingerle, Kurt; and Meister, Karl, to Ferdinand Aufschlager KG. Well construction. 4,071,087, Cl. 166-278.000.
Ingersoll-Rand Company: *See—*
Dively, Charles R.; and Peterson, R. Kenneth, 4,071,098, Cl. 175-53.000.
Inoue, Tuyosi; Kimura, Masao; and Matuda, Humikazu, to Nippon Paint Co., Ltd. Process for treatment of waste water exhausted from water-wash spray booth using water-soluble paint. 4,071,449, Cl. 210-53.000.
Institut Francais du Petrole: *See—*
Cohen, Choua; and Sillion, Bernard, 4,071,459, Cl. 252-50.000.
International Business Machines Corporation: *See—*
Eichelberger, Edward Baxter; and Williams, Thomas Walter, 4,071,902, Cl. 364-716.000.
Feierabend, Louis Bock; and Proper, David Staples, 4,071,869, Cl. 360-135.000.
Head, Stanley Maurice; and Melas, Constantine Michael, 4,071,903, Cl. 364-728.000.
Knepper, Ronald William, 4,071,783, Cl. 307-270.000.
Sherk, Thomas Albert, 4,071,287, Cl. 316-19.000.
International Flavors & Fragrances Inc.: *See—*
Vinals, Joaquin Francisco; Kiwala, Jacob; Hruza, Denis E., Sr.; Hall, John B.; and Vock, Manfred Hugo, 4,071,034, Cl. 131-17.00R.
Vinals, Joaquin Francisco; Kiwala, Jacob; Hruza, Denis E., Sr.; Hall, John B.; and Vock, Manfred Hugo, 4,071,535, Cl. 260-345.100.
International Harvester Company: *See—*
Moreno, Emil F.; Hajek, Ralph S.; and Marquardt, Julius F., 4,070,924, Cl. 74-710.500.
International Laser Systems, Inc.: *See—*
Manning, Richard J., 4,071,752, Cl. 250-213.0VT.
International Nickel Company, Inc., The: *See—*
Sutton, William H., 4,071,416, Cl. 204-38.00R.
International Research & Development Company Limited: *See—*
Dobbing, Peter Philip; and Kendall, Peter William, 4,071,795, Cl. 310-219.000.
International Standard Electric Corporation: *See—*
Barsellotti, John Anthony, 4,071,712, Cl. 179-99.000.
Dobbert, Gerd, 4,071,810, Cl. 315-400.000.
Jammes, Emanuel Marie Augustin; and Bordier, Jean-Louis Marie Henri, 4,071,840, Cl. 340-166.500.
Weir, Donald A.; Usher, Eric S.; and Howells, George A., 4,071,692, Cl. 178-68.000.
International Telephone and Telegraph Corporation: *See—*
Jovic, Nicola Ljotic; and Rinker, Steven Allen, 4,071,699, Cl. 179-5.500.
International Video Corporation: *See—*
Vidovic, Nikola, 4,071,782, Cl. 307-268.000.
Interox Chemicals Limited: *See—*
Hildon, Anthony MacDonald; and Greenhalgh, Peter Frederick, 4,071,541, Cl. 260-348.250.
Interpace Corporation: *See—*
Bredbenner, Ambrose M., Jr., 4,071,663, Cl. 429-181.000.
Intraco, Inc.: *See—*
Jones, Robert D., 4,071,136, Cl. 198-735.000.
Inventio AG: *See—*
Daniel, Peter, 4,071,121, Cl. 188-196.00P.
Irissou, Pierre-Regis Marie: *See—*
Weiss, Jean Michel; and Irissou, Pierre-Regis Marie, 4,071,809, Cl. 315-312.000.
Irwin, Arlyle Floyd. Model helicopter throttle governor/collective pitch control apparatus. 4,071,811, Cl. 318-16.000.
Ise, Katsuhiro; Kuramoto, Yoshio; and Yamazaki, Yasuo, to Minolta Camera Kabushiki Kaisha. Focussing plate. 4,071,292, Cl. 350-128.000.
Isham, Robert Haynes, II, to RCA Corporation. Sawtooth voltage generator for constant amplitude sawtooth waveform from varying frequency control signal. 4,071,776, Cl. 307-228.000.
Ishibe, Shuhei; Okumichi, Toshiharu; Ishihara, Yasushi; and Naka, Hisayoshi, to Arakawa Rinsan Kagaku Kogyo Kabushiki Kaisha. Process for preparing stable aqueous dispersions of rosin-base material. 4,071,375, Cl. 106-238.000.
Ishihara, Yasushi: *See—*
Ishibe, Shuhei; Okumichi, Toshiharu; Ishihara, Yasushi; and Naka, Hisayoshi, 4,071,375, Cl. 106-238.000.
Ishii, Kazuhide: *See—*
Ogawa, Hiroshi; Ishii, Kazuhide; Nakamura, Matsuaki; Tamai, Yasuo; and Akashi, Goro, 4,071,654, Cl. 428-336.000.
Ishii, Mitsuaki: *See—*
Sumida, Shizuo; Nii, Kazuo; Shimizu, Osamu; Ueda, Atsushi; and Ishii, Mitsuaki, 4,071,889, Cl. 364-200.000.
Ishikawa, Hitoshi: *See—*
Yamamoto, Kimihiko; and Ishikawa, Hitoshi, 4,070,977, Cl. 112-259.000.
Ishikawa, Riichi; and Takase, Toshio, to Mitsubishi Denki Kabushiki Kaisha. Passenger transportation apparatus. 4,071,135, Cl. 198-324.000.
Itou, Takaaki: *See—*
Konishi, Masami; Nakamura, Norihiko; Itou, Takaaki; and Kikuchi, Kazuo, 4,071,585, Cl. 261-36.00A.
Ivanov, Andrei Konstantinovich: *See—*
Afonin, Mikhail Egorovich; Belyanin, Petr Nikolaevich; and Ivanov, Andrei Konstantinovich, 4,071,188, Cl. 233-29.000.
Ives, Frank Elmer. Cylinder-making apparatus and method. 4,071,389, Cl. 156-175.000.
J. M. Voith GmbH: *See—*
Schmeisser, Walter; and Talasz, Johann, 4,071,128, Cl. 192-133.000.
Jablkiewicz, Jerzy: *See—*
Ostrowski, Jerzy; Sierputowski, Piotr; Turkowski, Lukasz; Jablkiewicz, Jerzy; Pacholski, Jan; and Jedryka, Tadeusz, 4,070,812, Cl. 57-58.890.
Jachna, Waclaw: *See—*
Jedo, Antoni; Jachna, Waclaw; and Szczesny, Adolf, 4,071,440, Cl. 209-44.000.
Jackman, Peter Ronald, to Inertia Switch Limited. Plunger-release shock responsive control apparatus having adjustable seat for sensor mass. 4,071,723, Cl. 200-61.45R.
Jacob Schlaepfer & Co. A.G.: *See—*
Schlaepfer, Robert J., 4,071,387, Cl. 156-148.000.
Jacobs, Edward H.: *See—*
Lathrop, Francis O., Jr.; Jacobs, Edward H.; Wood, William E.; and Taylor, Patrick A., 4,071,862, Cl. 360-97.000.
Jacobs, James D. Holder for elongate tobacco product. 4,071,036, Cl. 131-187.000.
Jacobs, Stanley C.: *See—*
Foster, Perry A., Jr.; and Jacobs, Stanley C., 4,071,420, Cl. 204-67.000.
Jacquemin, Francis; Terneau, Robert; and Voiturier, Jean-Pierre, to Glaverbel-Mecaniver. Fireproof glasswork. 4,071,649, Cl. 428-215.000.
James, Arthur M.; and Dalton, Edgar Terry, to James, Arthur M. Bearing member. 4,070,836, Cl. 52-245.000.
James, Barrie Sydney, to W. Canning & Company, Ltd. Electrodeposition of zinc and additives therefor. 4,071,418, Cl. 204-55.00R.
James, Barrie Sydney, to W. Canning & Company, Ltd. Electrodeposition of zinc and additive therefore. 4,071,419, Cl. 204-55.00R.
Jameson, James J., to Gardner-Denver Company. Power transmission with torque converter lockup clutch. 4,071,125, Cl. 192-3.300.

Jameson, Robert W. Floor-pressure hold anchor. 4,070,834, Cl. 52-166.000.

Jammes, Emanuel Marie Augustin; and Bordier, Jean-Louis Marie Henri, to International Standard Electric Corporation. Switching device for reed relays in a matrix. 4,071,840, Cl. 340-166.500.

Jankowiak, Erwin M., to Dow Chemical Company, The. Method for controlling soil erosion. 4,071,400, Cl. 162-169.000.

Jansen, Josephus Johannes Maria, to Koninklijke Textielfabrieken M. Jansen de Wit B.V. Start up course for sock welt. 4,070,873, Cl. 66-172.00R.

Jarvis, Kenneth. Adjustable irrigation dam. 4,070,864, Cl. 61-29.000.

Jaworski, Andrzej: *See*—
Ciborowski, Stanislaw; Szczypinski, Zbigniew; Balcerzak, Kazimierz; Jaworski, Andrzej; Kasznia, Andrzej; Krzysztoforski, Andrzej; Kurowski, Stanislaw; Redzi, Jan; and Szparski, Jozef, 4,071,561, Cl. 260-586.00P.

Jean Walterscheid GmbH: *See*—
Kunze, Dieter, 4,071,263, Cl. 280-508.000.
von Allworden, Wilhelm, 4,071,105, Cl. 180-14.00R.

Jeannotte, Richard W. Extensible handle for a tool headpiece. 4,070,932, Cl. 81-177.00A.

Jedo, Antoni; Jachna, Waclaw; and Szczesny, Adolf, to Centralny Osrodek Projektowokonstrukcyjny Maszyn Gorniczych "Komag". Method and apparatus of stratification with tangential feed. 4,071,440, Cl. 209-44.000.

Jedryka, Tadeusz: *See*—
Ostrowski, Jerzy; Sierputowski, Piotr; Turkowski, Lukasz; Jablkiewicz, Jerzy; Pacholski, Jan; and Jedryka, Tadeusz, 4,070,812, Cl. 57-58.890.

Jenkins, David Conwil: *See*—
Dalton, Sally Elizabeth; Gingell, William George; Jenkins, David Conwil; King, Leslie George; Lee, Glyn Evan; and Thompson, Garth Molesdale, 4,071,528, Cl. 260-306.70T.

Jenn Air Corporation: *See*—
Jenn, Louis J.; and Cerola, Joseph J., 4,071,738, Cl. 219-400.000.
Jenn, Louis J.; and Cerola, Joseph J., 4,071,739, Cl. 219-400.000.

Jenn, Louis J.; and Cerola, Joseph J., to Jenn Air Corporation. Ventilated range with convertible radiant convection oven. 4,071,738, Cl. 219-400.000.

Jenn, Louis J.; and Cerola, Joseph J., to Jenn Air Corporation. Convertible radiant convection oven. 4,071,739, Cl. 219-400.000.

Jensen, Arne, to Danfoss A/S. Control device for an inverted rectifier. 4,071,900, Cl. 364-600.000.

Jervis B. Webb Company: *See*—
Folsom, Harold A.; and Bilson, David G., 4,070,972, Cl. 104-172.00S.

Jess, Hans Jurgen; and Friederichs, Karl-Heinz, to Hagenuk Vormals Neufeldt & Kuhnke GmbH. Method and arrangement for controlling the feeding of rods to a work tool in automatic screw machines and the like. 4,070,723, Cl. 10-90.000.

Jet Research Center, Inc.: *See*—
Dines, Jack E., 4,071,096, Cl. 175-4.600.

Joannou, Constantinos Joannou. Device for graphic communication. 4,071,690, Cl. 178-18.000.

Joffre, Robert L. Devices for cleaning, dusting, mopping or applying fluids to floors. 4,070,726, Cl. 15-231.000.

Johannesen, Donald Dixon, to Bendix Corporation, The. Variable adjuster for disc brake. 4,071,118, Cl. 188-71.900.

John Thomas Batts, Inc.: *See*—
Batts, John H., 4,071,146, Cl. 211-87.000.

Johnson, Bruce K., to Polaroid Corporation. Method of adjusting camera with latched shutter blade mechanism for shipment. 4,071,851, Cl. 354-354.000.

Johnson, Edwin Samuel; and Seely, John Hunter, to Abbott Laboratories. Treatment of a mammary or DMBA inducible tumor. 4,071,622, Cl. 424-177.000.

Johnson, Marvin M.; and Nowack, Gerhard P., to Phillips Petroleum Company. Process for producing methane from carbon monoxide and steam. 4,071,331, Cl. 48-197.00R.

Johnson, Steven J.: *See*—
Groves, Charles L., Jr.; and Johnson, Steven J., 4,071,897, Cl. 364-494.000.

Johnson, William Henry: *See*—
Hassall, Cedric Herbert; Johnson, William Henry; Krohn, Antonin; Smithen, Carey Ernest; and Thomas, William Anthony, 4,071,525, Cl. 260-295.0AM.

Jones, Edward Owen, to BICC Limited. Apparatus for winding wire or other elongate material. 4,071,199, Cl. 242-25.00A.

Jones, John R., to Lubeco, Inc. Mold release composition. 4,071,368, Cl. 106-38.280.

Jones, Ralph E. Air monitoring valve for combustion engines. 4,071,044, Cl. 137-479.000.

Jones, Raymond Henry: *See*—
Mathison, Ian William; Solomons, William Ebenezer; and Jones, Raymond Henry, 4,071,562, Cl. 260-600.00R.

Jones, Robert D., to Intraco, Inc. Cable control apparatus. 4,071,136, Cl. 198-735.000.

Jones, Robert N., to Xerox Corporation. Method of making composite xerographic photoreceptor with injecting contact layer for a photoconductive layer. 4,071,363, Cl. 96-1.50R.

Jonishi, Katsunori: *See*—
Nishikubo, Michio; Miura, Sei; Toyoda, Toshiaki; Jonishi, Katsunori; and Yoneta, Kouichi, 4,070,893, Cl. 72-234.000.

Jovic, Nicola Ljotic; and Rinker, Steven Allen, to International Telephone and Telegraph Corporation. Apparatus providing for the remote display of calling numbers in a telephone system. 4,071,699, Cl. 179-5.500.

Junck, John A.; Dezelan, Joseph A.; Larson, Donald J.; and White, Robert W., to Caterpillar Tractor Co. Auxiliary hydrostatic wheel drive. 4,071,106, Cl. 180-44.00F.

Jung, Johann; Kiehs, Karl; Zeeh, Bernd; and Theobald, Hans, to VASE Aktiengesellschaft. Salts of phosphonic acids. 4,071,551, Cl. 260-501.150.

Juvrud, Ingvald O., to Commercial Shearing, Inc. Tunnel liners and methods of making the same. 4,070,866, Cl. 61-45.00R.

K-Tron Corporation: *See*—
Van Ostenbridge, Ron; and Sturgeon, Michael E., 4,071,102, Cl. 177-165.000.

Kabushiki Kaisha Daini Seikosha: *See*—
Kamiya, Masaaki, 4,071,822, Cl. 324-111.000.
Yamashita, Shiro, 4,071,786, Cl. 310-361.000.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Iida, Akio, 4,071,108, Cl. 180-139.000.
Kawakatsu, Ichiro, 4,071,358, Cl. 75-154.000.
Motomura, Mitsuteru; Kojima, Chiaki; Ohta, Hiroshi; and Nemoto, Akira, 4,070,772, Cl. 37-117.500.

Kahn, Joe E., to Acme Chemical Company. Aqueous coating composition. 4,071,645, Cl. 427-340.000.

Kajima Corporation: *See*—
Sato, Kuniaki, 4,070,837, Cl. 52-297.000.

Kakizaki, Fusayoshi: *See*—
Takemoto, Tadashi; Kakizaki, Fusayoshi; and Ariyoshi, Yasuo, 4,071,511, Cl. 260-112.50R.

Kalippke, Harald; Gerber, Richard; and Ehrmann, Karl, to Robert Bosch GmbH. Engine ignition timing signal generator having a reduced number of permanent magnets. 4,071,792, Cl. 310-70.00R.

Kalman, Erika; Haklik, Lajos; Eke, Anna; and Kovacs, Pal, to MTA Kozponti Kemiai Kutato Intezet. Micro-chamber for electron optical examinations particularly for the electron microscopic examination of biological objects. 4,071,766, Cl. 250-443.000.

Kamata, Michitake: *See*—
Katayama, Sakae; Kanada, Sadaoki; Kamata, Michitake; Sakaguchi, Yasuhiro; and Kojima, Katsumi, 4,071,445, Cl. 210-23.00H.

Kamerling, Marc A., to Donnelly Mirrors, Inc. Defrosting mirror. 4,071,736, Cl. 219-219.000.

Kaminaka, Nobuyuki; Kanai, Kenji; Nouchi, Norimoto; and Nomura, Noboru, to Matsushita Electric Industrial Co., Ltd. Narrow track MR head with side shields. 4,071,868, Cl. 360-113.000.

Kamiya, Masaaki, to Kabushiki Kaisha Daini Seikosha. Digital voltage detecting circuit for a power source. 4,071,822, Cl. 324-111.000.

Kamiya, Takashi; Teraji, Tsutomu Toyonaka; Hashimoto, Masashi; Oku, Teruo Kyoto; Nakaguti, Osamu; Saito, Yoshihisa; and Nakamura, Hitoshi, to Fujisawa Pharmaceutical Co., Ltd. Certain benzothiazole compounds. 4,071,527, Cl. 260-306.500.

Kamiya, Takeshi: *See*—
Kobayashi, Seizo; Hirayama, Toshiharu; Kamiya, Takeshi; Kezuka, Seiju; and Takeuchi, Hidesuke, 4,071,591, Cl. 264-45.300.

Kamm, W. F. G.: *See*—
Dittrich, Wolfhart; Heuer, Helmut; Kamm, W. F. G.; Kipp, Thorwald; Luhr, Gerhard; and Poggemeier, Erich, 4,071,637, Cl. 427-12.000.

Kamphuis, Gerrit George, to Stork Friesland B.V. Method and apparatus for preparing a so-called non-caking powder. 4,070,766, Cl. 34-12.000.

Kamyr, Inc.: *See*—
Prough, James R., 4,071,399, Cl. 162-16.000.

Kanada, Sadaoki: *See*—
Katayama, Sakae; Kanada, Sadaoki; Kamata, Michitake; Sakaguchi, Yasuhiro; and Kojima, Katsumi, 4,071,445, Cl. 210-23.00H.

Kanai, Kenji: *See*—
Kaminaka, Nobuyuki; Kanai, Kenji; Nouchi, Norimoto; and Nomura, Noboru, 4,071,868, Cl. 360-113.000.

Kanaya, Motonori: *See*—
Suzuki, Masane; Kanaya, Motonori; and Matsuoka, Takeshi, 4,071,291, Cl. 350-3.500.

Kanda, Hiroshi, to Nisshin Oil Mills, Ltd., The. Process for producing xanthomonas polysaccharide on a soybean whey medium. 4,071,406, Cl. 195-31.00P.

Kannam, Peter Joseph, to RCA Corporation. Transistor having improved junction breakdown protection integrated therein. 4,071,852, Cl. 357-13.000.

Kanou, Kazuyoshi. Device for automatic door closing. 4,070,727, Cl. 16-72.000.

Kao Soap Co., Ltd.: *See*—
Iijima, Eiji; Watanabe, Hiroshi; and Hayashi, Shizuo, 4,071,475, Cl. 252-545.000.
Matsunaga, Kinjiro; Nakagawa, Yunosuke; and Arai, Haruhiko, 4,071,462, Cl. 252-99.000.

Kaplan, Murray L.; Herbster, Terry N.; and Holden, Alan F., to Telesciences, Inc. Dial pulse detector. 4,071,708, Cl. 179-16.00E.

Kappas, Chris S. Outboard motor and weed guard therefor. 4,070,984, Cl. 115-42.000.

Karabedian, James A., to Owens-Illinois, Inc. Container with improved heat-shrunk cellular sleeve. 4,071,597, Cl. 264-230.000.

Karl Kroyer St. Anne's Limited: *See*—
Hicklin, Denis Raymond; White, Derek Graham Walter; and Attwood, Brian William, 4,071,651, Cl. 428-284.000.

Karpati, Egon: *See*—
Tuba, Zoltan; Marsai, Maria; Biro, Katalin; Szporny, Laszlo; Karpati, Egon; and Szeberenyi, Szabolcs, 4,071,515, Cl. 260-239.500.

Kashiwa, Norio, to Mitsui Petrochemical Industries Ltd. Process for polymerizing or copolymerizing olefins. 4,071,672, Cl. 526-122.000.

Kashiwa, Norio; Fuji, Saburo; and Tanaka, Masahide, to Mitsui Petrochemical Industries Ltd. Process for polymerization or copolymerization of olefin and catalyst compositions used therefor. 4,071,674, Cl. 526-125.000.

Kastner, Sid. Displaceable building unit for off-the-wall games. 4,070,805, Cl. 52-86.000.

Kasznia, Andrzej: *See*—
Ciborowski, Stanislaw; Szczypinski, Zbigniew; Balcerzak, Kazimierz; Jaworski, Andrzej; Kasznia, Andrzej; Krzysztoforski, Andrzej; Kurowski, Stanislaw; Redzi, Jan; and Szparski, Jozef, 4,071,561, Cl. 260-586.00P.

Katayama Chemical Works Co., Ltd.: *See*—
Katayama, Sakae; Kanada, Sadaoki; Kamata, Michitake; Sakaguchi, Yasuhiro; and Kojima, Katsumi, 4,071,445, Cl. 210-23.00H.

Katayama, Sakae; Kanada, Sadaoki; Kamata, Michitake; Sakaguchi, Yasuhiro; and Kojima, Katsumi, to Daicel, Ltd.; and Katayama Chemical Works Co., Ltd. Method and apparatus for treating waste water on ships. 4,071,445, Cl. 210-23.00H.

Katekhda, Izzed-Din: *See*—
Lees, Geoffrey; and Katekhda, Izzed-Din, 4,070,903, Cl. 73-38.000.

Katkov, Jury Vasilievich: *See*—
Kholmogorov, Mikhail Vladimirovich; Katkov, Jury Vasilievich; and Gusev, Alexandr Mikhailovich, 4,070,892, Cl. 72-195.000.

Kato, Nobuo: *See*—
Korekawa, Takashi; Kato, Nobuo; and Yamaoka, Mikio, 4,070,957, Cl. 99-455.000.

Kato, Yutaka; Ouchi, Teruo; and Koshiishi, Kiyozo, to Olympus Optical Company, Ltd. Automatic blood serum applicator apparatus for cataphoretic use. 4,070,986, Cl. 118-7.000.

Katushkina, Nina Vasilievna: *See*—
Peradze, Tamaz Vladimirovich; Fridman, Eidlya Abramovna; Zheleznova, Nina Vsevolodovna; Kolikov, Vsevolod Mikhailovich; Bresler, Semen Khaimovich-Efimovich; Mchedlishvili, Boris Viktorovich; Molodkin, Viktor Mikhailovich; Molodkina, Ljudmila Mikhailovna; and Katushkina, Nina Vasilievna, 4,071,619, Cl. 424-90.000.

Kaufman, Howard N.: *See*—
Raimondi, Albert A.; Kaufman, Howard N.; and Wood, Norman J., 4,071,254, Cl. 277-3.000.

Kawai, Hirokazu: *See*—
Oguchi, Tetsuji; and Kawai, Hirokazu, 4,071,905, Cl. 364-784.000.

Kawai, Syuji: *See*—
Yamamoto, Kohzo; Kawai, Syuji; and Ohmori, Akio, 4,071,454, Cl. 210-321.00A.

Kawakami, Hiroshi: *See*—
Sawachika, Yasumasa; and Kawakami, Hiroshi, 4,071,484, Cl. 260-2.5AT.

Kawakatsu, Ichiro, to Kabushiki Kaisha Komatsu Seisakusho. Heat resisting copper base brazing filler metal. 4,071,358, Cl. 75-154.000.

Kawakatsu, Satoshi: *See*—
Usagawa, Yasushi; Yamashita, Kiyoshi; Nakatani, Mamoru; Masuda, Kosaku; and Kawakatsu, Satoshi, 4,071,365, Cl. 96-56.500.

Kawamata, Toshio: *See*—
Takenaka, Haruo; Okiyama, Toshiaki; and Kawamata, Toshio, 4,071,362, Cl. 96-1.400.

Kawanami, Mitsuru; Ohhinata, Ichiro; and Okuhara, Shinzi, to Hitachi, Ltd. Semiconductor switch. 4,071,779, Cl. 307-255.000.

Kawneer Company, Inc.: *See*—
Hubbard, S. Eugene, 4,070,806, Cl. 52-95.000.

Kayalioglu, Inanc, to Northern Telecom Limited. Pulse duration correction circuit. 4,071,781, Cl. 307-265.000.

Keele, D. Broadus, Jr., to Electro-Voice, Incorporated. Horn loudspeaker. 4,071,112, Cl. 181-187.000.

Keenan, Joseph F.: *See*—
Bushnell, Nolan K.; and Keenan, Joseph F., 4,071,697, Cl. 179-2.0TV.

Keg-Tainer, Inc.: *See*—
Vick, Carl J., 4,071,160, Cl. 220-5.00R.

Keigler, John Edward: *See*—
Muhlfelder, Ludwig; Keigler, John Edward; and Stewart, Brian, 4,071,211, Cl. 244-165.000.

Keller, Albert G.: *See*—
Schlau, Floyd E.; Morrison, Howard J.; and Keller, Albert G., 4,070,967, Cl. 101-301.000.

Kellner, Jackson M., to Smith International, Inc. Stabilizer. 4,071,285, Cl. 308-4.00A.

Kelly, Alcuin. Vertical clock. 4,070,819, Cl. 58-2.000.

Kelly, Brian M. Apparatus for dispersing agglomerates. 4,071,167, Cl. 366-172.000.

Kendall, Peter William: *See*—
Dobbing, Peter Philip; and Kendall, Peter William, 4,071,795, Cl. 310-219.000.

Kendrick, Robert H. Board game. 4,071,245, Cl. 273-243.0GA.

Kennecott Copper Corporation: *See*—
Marshall, David W.; and Agarwal, Jagdish Chandra, 4,071,737, Cl. 219-345.000.

Kenton, Joseph R.: *See*—
Banks, Robert L.; and Kenton, Joseph R., 4,071,471, Cl. 252-437.000.

Kernander, Warren N.; and Van Bennekom, Carl F., to General Electric Company. Shrouded jaws for hook-on type instruments. 4,071,824, Cl. 324-127.000.

Kerr, Andrew Guy: *See*—
Brown, Kenneth Robson; and Kerr, Andrew Guy, 4,070,800, Cl. 52-1.000.

Kerr, Ralph O.; and Barone, Bruno J., to Denka Chemical Corporation. Process for preparing maleic anhydride from C_4 hydrocarbons. 4,071,539, Cl. 260-346.750.

Kessler, David P.: *See*—
Ash, Stephen R.; Wilcox, Philip G.; and Kessler, David P., 4,071,444, Cl. 210-22.00A.

Kewanee Industries: *See*—
Petrocci, Alfonso N.; Merianos, John J.; and Green, Harold A., 4,071,628, Cl. 424-249.000.

Kezuka, Seiju: *See*—
Kobayashi, Seizo; Hirayama, Toshiharu; Kamiya, Takeshi; Kezuka, Seiju; and Takeuchi, Hidesuke, 4,071,591, Cl. 264-45.300.

Khalid, Joseph M.: *See*—
Cook, James W.; Khalid, Joseph M.; and Oster, Clark L., 4,071,836, Cl. 335-195.000.

Kholmogorov, Mikhail Vladimirovich; Katkov, Jury Vasilievich; and Gusev, Alexandr Mikhailovich. Arrangement for metal working by rolling. 4,070,892, Cl. 72-195.000.

Kiehs, Karl: *See*—
Jung, Johann; Kiehs, Karl; Zeeh, Bernd; and Theobald, Hans, 4,071,551, Cl. 260-501.150.

Kihara, Nobutoshi; and Morio, Minoru, to Sony Corporation. Servo-control system for signal recording and/or reproducing apparatus. 4,071,856, Cl. 360-73.000.

Kikuchi, Kazuo: *See*—
Konishi, Masami; Nakamura, Norihiko; Itou, Takaaki; and Kikuchi, Kazuo, 4,071,585, Cl. 261-36.00A.

Kikumoto, Ryoji; Tobe, Akihiro; Tonomura, Shinji; Ikoma, Hidenobu; and Honda, Kazuo, to Mitsubishi Chemical Industries Limited. Pharmaceutically active 2-omega-aminoalkoxydiphenyls. 4,071,559, Cl. 260-570.700.

Kikumoto, Ryoji: *See*—
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,071,621, Cl. 424-177.000.

Kilin, Viktor Evdokimovich; Galimov, Anas Galimovich; Yankovsky, Oleg Alexandrovich; Klushin, Nikolai Alexandrovich; and Maslakov, Petr Avramovich. Portable pneumatic percussive tool. 4,071,094, Cl. 173-139.000.

Kim, Choung Um, to Bristol-Myers Company. Substituted azetidinone aldehydes. 4,071,513, Cl. 260-239.00A.

Kimmell, Steven Donald, to Mattel, Inc. Truck for skateboard or the like. 4,071,256, Cl. 280-11.280.

Kimura, Masao: *See*—
Inoue, Tuyosi; Kimura, Masao; and Matuda, Humikazu, 4,071,449, Cl. 210-53.000.

King, Leslie George: *See*—
Dalton, Sally Elizabeth; Gingell, William George; Jenkins, David Conwil; King, Leslie George; Lee, Glyn Evan; and Thompson, Garth Molesdale, 4,071,528, Cl. 260-306.70T.

King, Roy R., to Industrial Industries, Inc. Grease extractor. 4,071,019, Cl. 126-299.00E.

Kinkead, Jordan A.; Pott, James T.; Sherman, Roger M.; and Sullivan, Eugene F., to County of Santa Clara, State of California. Wheelchair lift for public transportation vehicle. 4,071,152, Cl. 214-75.00R.

Kipp, Thorwald: *See*—
Dittrich, Wolfhart; Heuer, Helmut; Kamm, W. F. G.; Kipp, Thorwald; Luhr, Gerhard; and Poggemeier, Erich, 4,071,637, Cl. 427-12.000.

Kirby, Jane Parsons; and Borders, Donald Bruce, to American Cyanamid Company. Diaminoalditols useful in the preparation of antibacterial antibiotics AM31α, AM31β, and AM31γ. 4,071,560, Cl. 260-584.00R.

Kirschner, Helmut: *See*—
Griesshammer, Rudolf; Kirschner, Helmut; and Lechner, Gunther, 4,070,797, Cl. 51-326.000.

Kishi, Masaya: *See*—
Miyakawa, Seii; Kobayashi, Takashi; Kishi, Masaya; and Ogiro, Kenji, 4,070,743, Cl. 29-227.000.

Kishimoto, Yoshio, to Matsushita Electric Industrial Co., Ltd. Secondary-electron multiplier dynode. 4,071,474, Cl. 252-500.000.

Kitagawa, Minoru: *See*—
Andow, Fumio; Yamaura, Mitsuru; and Kitagawa, Minoru, 4,071,873, Cl. 361-64.000.

Kitazawa Shoji Kabushiki Kaisha: *See*—
Iino, Tsuyoshi, 4,071,220, Cl. 251-174.000.

Kitazume, Shoji: *See*—
Morikawa, Hiroyuki; and Kitazume, Shoji, 4,071,575, Cl. 260-677.00R.

Kitchen, John P.; Gabhart, Terry L.; and Lanham, Joseph S., to Hoover Ball and Bearing Co. Bed frame. 4,070,717, Cl. 5-176.00R.

Kiwala, Jacob: *See*—
Vinals, Joaquin Francisco; Kiwala, Jacob; Hruza, Denis E., Sr.; Hall, John B.; and Vock, Manfred Hugo, 4,071,034, Cl. 131-17.00R.
Vinals, Joaquin Francisco; Kiwala, Jacob; Hruza, Denis E., Sr.; Hall, John B.; and Vock, Manfred Hugo, 4,071,535, Cl. 260-345.100.

Klande, James R.: *See*—
Lindl, Willibald M.; Klande, James R.; and VanHulle, Glenn J., 4,071,635, Cl. 426-264.000.

Klimashko, Vladimir Vasilievich: *See—*
Tkach, Khaim Berkovich; Kostylev, Alexandr Dmitrievich; Tupitsyn, Konstantin Konstantinovich; Gurkov, Konstantin Stepanovich; Klimashko, Vladimir Vasilievich; Rozhkov, Leonid Georgievich; Bondar, Mikhail Jurievich; and Smolyanitsky, Boris Nikolaevich, 4,070,948, Cl. 91-234.000.

Klinkenberg, Herbert: *See—*
Stark, Ernst-Joachim; Vanhaiden, Peter; and Klinkenberg, Herbert, 4,071,495, Cl. 260-42.180.

Klosowski, Jerome M.: *See—*
Frye, Cecil L.; and Klosowski, Jerome M., 4,071,498, Cl. 260-46.50G.

Klushin, Nikolai Alexandrovich: *See—*
Kilin, Viktor Evdokimovich; Galimov, Anas Galimovich; Yankovsky, Oleg Alexandrovich; Klushin, Nikolai Alexandrovich; and Masiakov, Petr Avramovich, 4,071,094, Cl. 173-139.000.

Knell, Everett W.; and Green, Norman W., to Occidental Petroleum Corporation. Staged heating by oxidation of carbonaceous material. 4,071,432, Cl. 208-8.000.

Knepper, Ronald William, to International Business Machines Corporation. Enhancement/depletion mode field effect transistor driver. 4,071,783, Cl. 307-270.000.

Knobel, Max. Attachment for air gauging apparatus. 4,070,902, Cl. 73-37.500.

Knothe, Herbert: *See—*
Andrascheck, Hans-Joachim; Mucke, Rainer; Lorz, Werner; Borchard, Heinz; Buck, Jurgen; Knothe, Herbert; and Rybka, Bruno, 4,071,490, Cl. 260-23.0XA.

Knox, Richard M.: *See—*
Barger, Franklin V., Jr.; Knox, Richard M.; and Roberts, Jefery R., 4,071,698, Cl. 179-2.00R.

Kobayashi, Seizo; Hirayama, Toshiharu; Kamiya, Takeshi; Kezuka, Seiju; and Takeuchi, Hidesuke, to Nippon Petrochemicals Co. Ltd. Method of manufacturing foamed thermoplastic resin profiles. 4,071,591, Cl. 264-45.300.

Kobayashi, Takashi: *See—*
Miyakawa, Seii; Kobayashi, Takashi; Kishi, Masaya; and Ogiro, Kenji, 4,070,743, Cl. 29-227.000.

Koblizek, Pavel: *See—*
Vasek, Vitezslav; Koblizek, Pavel; and Prazak, Karel, 4,071,052, Cl. 139-436.000.

Koch, Heinz: *See—*
Grube, Manfred; Gorski, Wilhelm; and Koch, Heinz, 4,070,884, Cl. 72-39.000.

Kochem, Robert C., to Texas Instruments Incorporated. Motor protector circuit. 4,071,871, Cl. 361-27.000.

Kochem, Robert C., to Texas Instruments Incorporated. Detector apparatus. 4,071,875, Cl. 361-113.000.

Koenig, Karl-Heinz: *See—*
Rentzea, Costin; Zeeh, Bernd; Koenig, Karl-Heinz; and Pommer, Ernst-Heinrich, 4,071,685, Cl. 548-312.000.

Koester, Eberhard; Wunsch, Gerd; Schoenafinger, Eduard; and Schneehage, Hans Henning, to BASF Aktiengesellschaft. Manufacture of gamma-iron(III) oxide. 4,071,610, Cl. 423-634.000.

Kofler, Roland: *See—*
Kunz, Heimut; and Kofler, Roland, 4,070,883, Cl. 72-14.000.

Kohkoku Chemical Industry Co., Ltd.: *See—*
Sawachika, Yasumasa; and Kawakami, Hiroshi, 4,071,484, Cl. 260-2.5AT.

Kohlen, Rudolf: *See—*
Hafke, Carl; and Kohlen, Rudolf, 4,071,332, Cl. 48-202.000.

Kohnke, Ole Bjorn, to Hesse, Ruth Lee. Lung-venting apparatus. 4,071,025, Cl. 128-145.700.

Koike, Shin'ichi; Hayashi, Seijiro; and Takayama, Michio, to Nippon Electric Co., Ltd. Transversal type automatic phase and amplitude equalizer. 4,071,827, Cl. 325-42.000.

Koinuma, Tokuju; Yamamiya, Hideki; and Tashiro, Norio, to Tokyo Shibaura Electric Co., Ltd. Magnetron device having magnetic means for generating a uniform interaction field. 4,071,804, Cl. 315-39.710.

Kojima, Chiaki: *See—*
Motomura, Mitsuteru; Kojima, Chiaki; Ohta, Hiroshi; and Nemoto, Akira, 4,070,772, Cl. 37-117.500.

Kojima, Katsumi: *See—*
Katayama, Sakae; Kanada, Sadaoki; Kamata, Michitake; Sakaguchi, Yasuhiro; and Kojima, Katsumi, 4,071,445, Cl. 210-23.00H.

Kok, Pieter Willem, to North American Philips Corporation. Pneumoencephalography chair. 4,071,231, Cl. 269-325.000.

Kolakowski, Manfred: *See—*
Bollig, Georg; Streubel, Hans; and Kolakowski, Manfred, 4,071,074, Cl. 164-448.000.

Kolb, Alan C.; and Drummond, James E., to Maxwell Laboratories, Inc. Method and apparatus for precipitating particles from a gaseous effluent. 4,071,334, Cl. 55-2.000.

Kolechko, Alexei Afanasievich: *See—*
Zarechensky, Anatoly Vasilievich; Kolechko, Alexei Afanasievich; Manov, Vladimir Mikhailovich; Korjukova, Alla Grigorievna; Savran, Vasily Grigorievich; and Serenko, Alexandr Nikitich, 4,071,734, Cl. 219-146.310.

Kolikov, Vsevolod Mikhailovich: *See—*
Peradze, Tamaz Vladimirovich; Fridman, Eidlya Abramovna; Zheleznova, Nina Vsevolodovna; Kolikov, Vsevolod Mikhailovich; Bresler, Semen Khaimovich-Efimovich; Mchedlishvili, Boris Viktorovich; Molodkin, Viktor Mikhailovich; Molodkina, Ljudmila Mikhailovna; and Katushkina, Nina Vasilievna, 4,071,619, Cl. 424-90.000.

Komarek, Karl R.; and Komarek, Richard K., to Lost River Mining Corporation Limited. Method of forming fluorite briquettes. 4,071,595, Cl. 264-66.000.

Komarek, Richard K.: *See—*
Komarek, Karl R.; and Komarek, Richard K., 4,071,595, Cl. 264-66.000.

Komiya, Takao: *See—*
Marushima, Giichi; Tanaka, Hiroshi; Tosaka, Umi; Takahashi, Shinkichi; and Komiya, Takao, 4,071,361, Cl. 96-1.400.

Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, to Canon Kabushiki Kaisha. Copying apparatus for sheet originals and thicker originals. 4,071,295, Cl. 355-3.0SH.

Kongelka, Robert Michael, to RCA Corporation. Releasable mounting system. 4,071,217, Cl. 248-309.00R.

Konig, Hans-Bodo; Metzger, Karl Georg; and Schrock, Wilfried, to Bayer Aktiengesellschaft. Oxoimidazolidinylthiocarbonyl derivatives of ceph-3-em-4-carboxylic acids. 4,071,683, Cl. 544-28.000.

Koninklijke Textielfabrieken M. Jansen de Wit B.V.: *See—*
Jansen, Josephus Johannes Maria, 4,070,873, Cl. 66-172.00R.

Konishi, Masami; Nakamura, Norihiko; Itou, Takaaki; and Kikuchi, Kazuo, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Aisan Industry Company, Limited. Variable venturi type carburetor. 4,071,585, Cl. 261-36.00A.

Konishiroku Photo Industry Co., Ltd.: *See—*
Amano, Tadashi; Mukaihara, Yoshitaka; and Nakamura, Tadashi, 4,071,299, Cl. 356-202.000.

Konle, Robert L.: *See—*
Pury, Thomas; Konle, Robert L.; and Sivertsen, Marvin L., 4,071,767, Cl. 250-444.000.

Konobe, Takeo; Onoda, Tetsuo; and Ono, Koichi, to Research Foundation for Microbial Diseases of Osaka University. Process for preparing virus disease live vaccines. 4,071,618, Cl. 424-89.000.

Koolaj es Foldgazbanyaszati Ipari Kutato Laboratorium: *See—*
Fulop, Miklos; and Rakar, Geza, 4,071,097, Cl. 175-56.000.

Koontz, Donald Eldridge; and Skurkiss, Peter Kenny, to Bell Telephone Laboratories, Incorporated. Process for decreasing the porosity of gold. 4,071,417, Cl. 204-38.00B.

Koppers Company, Inc.: *See—*
Boyer, David Harrison, III; and Mitchell, Richard Dale, 4,071,896, Cl. 364-471.000.

Korbin, Martin. Device for the quantitative determination of impurities, especially bacteria, on flat surfaces. 4,071,320, Cl. 23-259.000.

Korekawa, Takashi; Kato, Nobuo; and Yamaoka, Mikio, to Matsushita Electric Industrial Co., Ltd. Ice cream machine. 4,070,957, Cl. 99-455.000.

Korjukova, Alla Grigorievna: *See—*
Zarechensky, Anatoly Vasilievich; Kolechko, Alexei Afanasievich; Manov, Vladimir Mikhailovich; Korjukova, Alla Grigorievna; Savran, Vasily Grigorievich; and Serenko, Alexandr Nikitich, 4,071,734, Cl. 219-146.310.

Korver, Gailerd L., to Goodyear Tire & Rubber Company, The. Process for producing low carboxyl polyester fibers and other articles. 4,071,504, Cl. 260-75.0EP.

Koshiishi, Kiyozo: *See—*
Kato, Yutaka; Ouchi, Teruo; and Koshiishi, Kiyozo, 4,070,986, Cl. 118-7.000.

Koslowski, Gunter, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Diaphragm filtration system. 4,071,453, Cl. 210-232.000.

Kossoff, George, to Commonwealth of Australia, The. Ultrasonic beam scanning. 4,070,905, Cl. 73-614.000.

Koster, William Henry: *See—*
Dolfini, Joseph Edward; Slusarchyk, William A.; and Koster, William Henry, 4,071,682, Cl. 544-21.000.

Kostylev, Alexandr Dmitrievich: *See—*
Tkach, Khaim Berkovich; Kostylev, Alexandr Dmitrievich; Tupitsyn, Konstantin Konstantinovich; Gurkov, Konstantin Stepanovich; Klimashko, Vladimir Vasilievich; Rozhkov, Leonid Georgievich; Bondar, Mikhail Jurievich; and Smolyanitsky, Boris Nikolaevich, 4,070,948, Cl. 91-234.000.

Kotzur, Joachim: *See—*
Heinen, Manfred; and Kotzur, Joachim, 4,071,253, Cl. 277-3.000.

Koundakjian, Theodore H.: *See—*
Graves, Thomas M.; and Koundakjian, Theodore H., 4,071,617, Cl. 424-78.000.

Kovacs, Pal: *See—*
Kalman, Erika; Haklik, Lajos; Eke, Anna; and Kovacs, Pal, 4,071,766, Cl. 250-443.000.

Koyama, Masaharu: *See—*
Misono, Masayoshi; Koyama, Masaharu; and Asida, Tutomu, 4,070,749, Cl. 29-592.00R.

Koyano, Hitoshi; Sugaya, Nobuo; and Shiraogawa, Michio, to Oki Electric Industry Co., Ltd. System for printing images having a half tone. 4,071,849, Cl. 346-1.000.

Krafft Gobel KG Textilmaschinenbau: *See—*
Gobel, Volker, 4,070,738, Cl. 28-137.000.

Kraina, Jack H., to Caterpillar Tractor Co. Combined noise suppressing and air flow guide enclosure for engines. 4,071,009, Cl. 123-198.00E.

Krajci, Gary Edward; and Marrella, John Joseph, to Motorola, Inc. Binary coded cam selector switch having split housing and dent structure. 4,071,720, Cl. 200-6.00B.

Kramer, Heinrich: *See—*
Schneppendahl, Richard; Kramer, Heinrich; and Pepping, Franz, 4,071,750, Cl. 362-217.000.

Kraus, Gerard; and Hunt, Harold R., to Phillips Petroleum Company. Carbon black for low-hysteresis rubber compositions. 4,071,496, Cl. 260-42.360.

Krautkramer-Branson, Incorporated: *See*—
Niklas, Ludwig; and Walker, Philip A., 4,070,917, Cl. 73-598.000.
Krisst, Raymond J., to Combustion Engineering, Inc. Magnetostrictive position indicator. 4,071,818, Cl. 324-208.000.
Krohn, Antonin: *See*—
Hassall, Cedric Herbert; Johnson, William Henry; Krohn, Antonin; Smithen, Carey Ernest; and Thomas, William Anthony, 4,071,525, Cl. 260-295.0AM.
Kronogard, Sven-Olof, to United Turbine AB & Co. Gas turbine power plant. 4,070,825, Cl. 60-39.51R.
Krubski, George, to Cooper Industries, Inc. Display for knives. 4,071,144, Cl. 211-13.000.
Krude, Werner, to Uni-Cardan AG. Universal joint. 4,070,872, Cl. 64-21.000.
Krzysztoforski, Andrzej: *See*—
Ciborowski, Stanislaw; Szczypinski, Zbigniew; Balcerzak, Kazimierz; Jaworski, Andrzej; Kasznia, Andrzej; Krzysztoforski, Andrzej; Kurowski, Stanislaw; Redzi, Jan; and Szparski, Jozef, 4,071,561, Cl. 260-586.00P.
Kubitzek, Harry: *See*—
Bueb, Michael; Kubitzek, Harry; Langhans, Arthur; Rellensmann, Wolfgang; and Wagner, Wolfram, 4,070,817, Cl. 57-157.0TS.
Kuehner, Richard: *See*—
Bahel, Vijay Omprakash; and Kuehner, Richard, 4,070,870, Cl. 62-2.000.
Kuhlein, Klaus; Reuschling, Dieter-Bernd; Babej, Milos; Bartmann, Wilhelm; and Beck, Gerhard, to Hoechst Aktiengesellschaft. Pyrrolidones and process for preparing them. 4,071,530, Cl. 260-326.450.
Kuhn, Johannes, to V.G.S. G.m.b.H. Clip for assembling screens, panels or bulkhead sections. 4,070,838, Cl. 52-400.000.
Kuhns, Garrett D.; Astorp, Norman E.; Mullen, Richard V.; and Thomas, John Ellwood, to Economics Laboratory, Inc. Spray and foam producing nozzle apparatus. 4,071,195, Cl. 239-289.000.
Kulakov, Nikolai Konstantinovich: *See*—
Fidchunov, Leonid Nikolaevich; Balyk, Stanislav Sergeevich; Silka, Adolf Nikolaevich; Kulakov, Nikolai Konstantinovich; Bakhtarov, Leonid Fedorovich; Azimov, Alexandr Abramovich; Davydenko, Vladimir Mikhailovich; Balitsky, Nikolai Vasilievich; Likhogub, Evgeny Petrovich; and Dorfman, Gersh Abramovich, 4,071,414, Cl. 201-40.000.
Kumada, Akio, to Hitachi, Ltd. Dielectric matrix device. 4,071,841, Cl. 365-65.000.
Kumano, Hiroshi: *See*—
Nishino, Atsushi; Sonetake, Kazunori; and Kumano, Hiroshi, 4,071,636, Cl. 427-2.000.
Kumiai Chemical Industry Co., Ltd.: *See*—
Hayashi, Eiichi; Takita, Kiyoshi; Sugiyama, Hironari; and Nezu, Yukio, 4,071,534, Cl. 260-343.700.
Kummer, Rudolf; Schwirten, Kurt; Schindler, Hans-Dieter, deceased (by Schindler, Maria Elisabeth, heir-at-law); by Lang nee Schindler, Ute, heir-at-law; and by Schindler, Rainer, heir-at-law, to BASF Aktiengesellschaft. Manufacture of pent-4-en-1-al. 4,071,563, Cl. 260-601.00R.
Kunin, Robert, to Rohm and Haas Company. Method for regeneration of weak acid cation exchange resin. 4,071,446, Cl. 210-32.000.
Kunz, Helmut; and Kofler, Roland, to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft. System and assembly for measuring the movement of strip and hot strip mill. 4,070,883, Cl. 72-14.000.
Kunze, Dieter, to Jean Walterscheid GmbH. Coupling hook for a three-point connection on a tractor. 4,071,263, Cl. 280-508.000.
Kuramoto, Yoshio: *See*—
Ise, Katsuhiro; Kuramoto, Yoshio; and Yamazaki, Yasuo, 4,071,292, Cl. 350-128.000.
Kuraray Co., Ltd.: *See*—
Yamamoto, Kohzo; Kawai, Syuji; and Ohmori, Akio, 4,071,454, Cl. 210-321.00A.
Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Aoki, Katsumichi; Shimizu, Susumu; Satake, Keigo; Yamazaki, Shiro; and Hatakeyama, Nobuo, 4,071,633, Cl. 424-324.000.
Takahashi, Masaaki; Iizuka, Akira; and Asano, Kiro, 4,071,553, Cl. 260-514.00J.
Yoshida, Masafumi; and Obara, Hiroshi, 4,071,785, Cl. 310-331.000.
Kuris, Arthur. Ultrasonic inlaid article. 4,071,385, Cl. 156-73.100.
Kurosaki, Mutsuo, to Nifco Inc. Screw grommet. 4,070,945, Cl. 85-80.000.
Kurowski, Stanislaw: *See*—
Ciborowski, Stanislaw; Szczypinski, Zbigniew; Balcerzak, Kazimierz; Jaworski, Andrzej; Kasznia, Andrzej; Krzysztoforski, Andrzej; Kurowski, Stanislaw; Redzi, Jan; and Szparski, Jozef, 4,071,561, Cl. 260-586.00P.
Kurtz, Bruce Edward: *See*—
Amato, Wayne S.; Bandyopadhyay, Bhaskar; Fitch, Robert Herbert; and Kurtz, Bruce Edward, 4,071,572, Cl. 260-659.00A.
Kurz, Fredrik Wilhelm; and Rudmark, Hans. Method of manufacturing porous ceramic products by reacting flue gas dust and filter dust with clays or the like, such as expanded clay. 4,071,369, Cl. 106-40.00R.
Kuse, Matsuo: *See*—
Murata, Tomoji; Nakamura, Yoshihiro; Shibazaki, Kenji; and Kuse, Matsuo, 4,071,721, Cl. 200-38.00B.
Kusters, Eduard: *See*—
Kutz, Johannes, 4,070,875, Cl. 68-3.0SS.
Kutz, Johannes, to Kusters, Eduard. Apparatus for treating of synthetic textile webs. 4,070,875, Cl. 68-3.0SS.
Labatt Breweries of Canada Limited: *See*—
Marino, Otto M., 4,070,854, Cl. 53-381.00A.
Laboratoire Theranol: *See*—
Prugnaud, Robert Louis, 4,071,314, Cl. 23-230.00B.
LaFleur, Arthur E. Valve bag. 4,071,187, Cl. 229-62.500.
LaFreda, John T. Dispenser for ice cream or the like. 4,071,308, Cl. 425-284.000.
La Haye, Paul G.; and Anderson, Ralph E., to Hague International. Insulated wall means and method. 4,070,841, Cl. 52-506.000.
Lainez, Lucien: *See*—
Bijon, Paul; Fichot, Bernard; and Lainez, Lucien, 4,071,854, Cl. 358-128.000.
Laliberte, Real: *See*—
Ferland, Jean-Marie; Laliberte, Real; Lippmann, Wilbur; and Pugsley, Thomas A., 4,071,552, Cl. 260-501.170.
Lam, Charles Tak Wai, to Miles Laboratories, Inc. Test composition and device for determining peroxidatively active substances and process for preparing same. 4,071,317, Cl. 23-253.0TP.
Lam, Charles Tak Wai, to Miles Laboratories, Inc. Test composition and device for determining peroxidatively active substances. 4,071,318, Cl. 23-253.0TP.
Lam, Charles Tak Wai, to Miles Laboratories, Inc. Test composition and device for determining peroxidatively active substances. 4,071,321, Cl. 23-253.0TP.
Lama, William L.: *See*—
Hammond, Thomas J.; and Lama, William L., 4,071,799, Cl. 313-44.000.
Lambrecht, Richard Arthur, to Union Carbide Corporation. Anode and cathode lead wire assembly for solid electrolytic capacitors. 4,070,747, Cl. 29-570.000.
Land, Walter Henry. Fastening device. 4,070,736, Cl. 24-153.000.
Laney, Bill C.: *See*—
Grable, Donovan B.; and Laney, Bill C., 4,071,085, Cl. 166-84.000.
Lang nee Schindler, Ute, heir-at-law: *See*—
Kummer, Rudolf; Schwirten, Kurt; Schindler, Hans-Dieter, deceased; Lang nee Schindler, Ute, heir-at-law; and Schindler, Rainer, heir-at-law, 4,071,563, Cl. 260-601.00R.
Lang, Peter: *See*—
Ermel, Heinrich; Fruth, Franz; Fryda, Georg; Lang, Peter; Rau, Fritz; and Vossnacke, Jurgen, 4,071,296, Cl. 355-15.000.
Lange, Kai; Wiesen, Ernest J.; and Woronowicz, Eric M., to General Electric Company. Scintillation camera with improved output means. 4,071,762, Cl. 250-369.000.
Langhans, Arthur: *See*—
Bueb, Michael; Kubitzek, Harry; Langhans, Arthur; Rellensmann, Wolfgang; and Wagner, Wolfram, 4,070,817, Cl. 57-157.0TS.
Lanham, Joseph S.: *See*—
Kitchen, John P.; Gabhart, Terry L.; and Lanham, Joseph S., 4,070,717, Cl. 5-176.00R.
Lapidot, Mordechai: *See*—
Eisenberg, Eli; Altmann, Gideon; Bogokovsky, Bianca; and Lapidot, Mordechai, 4,071,412, Cl. 195-102.000.
Larson, Donald J.: *See*—
Junck, John A.; Dezelan, Joseph A.; Larson, Donald J.; and White, Robert W., 4,071,106, Cl. 180-44.00F.
Lasher, Edward A., to Whittaker Corporation. One-coat polyester-based coating and method of making same. 4,071,578, Cl. 260-850.000.
Latham, Raymond John; and Holloway, Arthur John, to Imperial Chemical Industries Limited. Quenching of polymeric film. 4,071,589, Cl. 264-22.000.
Lathrop, Francis O., Jr.; Jacobs, Edward H.; Wood, William E.; and Taylor, Patrick A., to Nashua Corporation. Disc cartridge. 4,071,862, Cl. 360-97.000.
Laurin, Dean G.: *See*—
Wagenknecht, John H.; and Laurin, Dean G., 4,071,429, Cl. 204-231.000.
Lautner, Max E.; and West, Bernard J., to Gould Inc. Welded stator for electric motors. 4,071,787, Cl. 310-42.000.
Lesch, Bruce E.; and Starks, Charles M., to Continental Oil Company. Preparation of cresols and xylenols from tetramethylphenols and pentamethylphenol. 4,071,566, Cl. 260-621.00D.
LeBlanc, Wayne J., to Horsburgh and Scott Company, The. Composite gear having carburized teeth and method of making same. 4,070,920, Cl. 74-446.000.
Lechner, Gunther: *See*—
Griesshammer, Rudolf; Kirschner, Helmut; and Lechner, Gunther, 4,070,797, Cl. 51-326.000.
Lecouvreur, Paul: *See*—
Guidez, Joel; Lecouvreur, Paul; and Roumailhac, Jean, 4,071,303, Cl. 415-112.000.
Lee, David Quon; and Rovnyak, Richard Michael, to GTE Automatic Electric Laboratories Incorporated. Line conditioning and transfer circuit. 4,071,709, Cl. 179-18.0HB.
Lee, Glyn Evan: *See*—
Dalton, Sally Elizabeth; Gingell, William George; Jenkins, David Conwil; King, Leslie George; Lee, Glyn Evan; and Thompson, Garth Molesdale, 4,071,528, Cl. 260-306.70T.
Leeper, David Garth, to Bell Telephone Laboratories, Incorporated. Thinned aperiodic antenna arrays with improved peak sidelobe level control. 4,071,848, Cl. 343-844.000.
Lees, Geoffrey; and Katekhda, Izzed-Din, to Dunlop Limited. Outflow meter for measuring surface drainage characteristics. 4,070,903, Cl. 73-38.000.
Legat, Wilhelm H.; Taft, Keith G.; and Tiefert, Karl H., to Raytheon Company. Integrated circuit structure having semiconductor resistance regions. 4,070,748, Cl. 29-577.00C.
Leggiere, Robert; and Saggese, Michael Frank. Simulated shingle arrangement. 4,070,843, Cl. 52-521.000.

Legille, Edouard; and Mahr, Rene N., to S.A. des Anciens Etablissements Paul Wurth. Blast furnace charging method and apparatus. 4,071,166, Cl. 222-1.000.
Le Goff, Yannick: *See*—
Senes, Michel; Le Goff, Yannick; and Gourdier, Jean-Francois, 4,071,472, Cl. 252-455.00R.
Legrand, Maurice Francois; and Cholat-Serpoud, Gerard, to Skis Rossignol S.A. Club Rossignol S.A. Ski and method of making same. 4,071,264, Cl. 280-610.000.
Leighty, Conard E., to Caterpillar Tractor Co. Engine side guard mounting. 4,071,107, Cl. 180-69.00R.
Leijonhufvud, Gosta Karl Knutsson; and Thyselius, Per-Olof, to Telefonaktiebolaget L M Ericsson. Method of and apparatus for addressing a buffer memory in a transit exchange for synchronous data signals. 4,071,701, Cl. 179-15.0AT.
Leitz, Ludwig; Heitmann, Knut; Schneider, Eckart; and Schaefer, Klaus Dieter, to Ernst Leitz GmbH. Method and apparatus for photoelectrically determining the position of at least one image focus plane. 4,071,297, Cl. 356-4.000.
Leitz, Ludwig; Heitmann, Knut; and Schmidt, Horst, to Ernst Leitz GmbH. Apparatus for measurement of mechanical aberrations affecting stereoscopic image analysis. 4,071,772, Cl. 250-558.000.
Lejeune, Daniel, to Compagnie Generale des Etablissements Michelin. Tire pressure variation detector. 4,071,724, Cl. 200-61.250.
LeMay, Christopher Archibald Gordon, to EMI Limited. Radiography apparatus with photocell drift compensating means. 4,071,760, Cl. 250-363.00S.
Lensel, Robert Marc: *See*—
Bourrie, Georges E.; and Lensel, Robert Marc, 4,071,271, Cl. 292-201.000.
Leopoldi, Norbert. Paper dispenser having a frictional discharge assistant. 4,071,165, Cl. 221-259.000.
Les Cables de Lyon S.A.: *See*—
Comte, Georges, 4,071,834, Cl. 333-95.00R.
Leslie Hartridge Limited: *See*—
Emerson, Reginald Stanley, 4,070,907, Cl. 73-119.00A.
Levenson, Ellene S. Folding doll house. 4,070,789, Cl. 46-12.000.
Lever Brothers Company: *See*—
Evans, William Price; and Naik, Appayya Raghunath, 4,071,523, Cl. 260-293.760.
McGee, Thomas; and Roberts, David William, 4,071,456, Cl. 252-8.700.
Wilton, Inga Elna Maria; Envall, Lennart Olof Gunnemar; Sundstroem, Kurt Lage; and Moran, David Patrick Joseph, 4,071,634, Cl. 426-604.000.
Lewinter, Barbara: *See*—
Lewinter, Orest; and Lewinter, Barbara, 4,070,820, Cl. 58-21.130.
Lewinter, Orest; and Lewinter, Barbara. Double kitchen timer. 4,070,820, Cl. 58-21.130.
Liang, Shou C.: *See*—
Charlton, Thomas L.; Redden, Robert F.; Hirsch, Horst E.; and Liang, Shou C., 4,071,422, Cl. 204-105.00R.
Libbey-Owens-Ford Company: *See*—
Blausey, Richard H., Jr., 4,071,344, Cl. 65-29.000.
Liborius, Erik: *See*—
Hovmand, Svend; and Liborius, Erik, 4,070,765, Cl. 34-10.000.
Lichti, Reiner, to Siemens Aktiengesellschaft. Arrangement for recording characters composed of matrix-like rastered character elements. 4,071,130, Cl. 197-1.00R.
Liebert, Richard B., to North American Philips Corporation. Electrophoretic image display having an improved switching time. 4,071,430, Cl. 204-299.00R.
Lifetime Carbide Co.: *See*—
Gray, Gorman D., 4,071,141, Cl. 206-372.000.
Like, Burton M., to American Cyanamid Company. Abrasive scouring block (and support therefor). 4,071,333, Cl. 51-304.000.
Likhogub, Evgeny Petrovich: *See*—
Fidchunov, Leonid Nikolaevich; Balyk, Stanislav Sergeevich; Silka, Adolf Nikolaevich; Kulakov, Nikolai Konstantinovich; Bakhtarov, Leonid Fedorovich; Azimov, Alexandr Abramovich; Davydenko, Vladimir Mikhailovich; Balitsky, Nikolai Vasilievich; Likhogub, Evgeny Petrovich; and Dorfman, Gersh Abramovich, 4,071,414, Cl. 201-40.000.
Lincoln Electric Company, The: *See*—
Bilczo, Dale Louis; Golonka, Kenneth Anthony; Overman, John Arthur; and Carroll, John Ernest, 4,071,885, Cl. 363-64.000.
Linden, Heinz; Gress, Wolfgang; and Offermann, Wilhelm, to Henkel KGaA. Anti-settling agents for pigmented aqueous lacquer and process for the manufacture of said agents. 4,071,487, Cl. 260-22.0TN.
Lindl, Willibald M.; Klande, James R.; and VanHulle, Glenn J., to General Mills, Inc. Mixes and processes for preparing meat products. 4,071,635, Cl. 426-264.000.
Lines, Lancelot H., to Senil Nominnees Pty. Ltd.; Commonwealth of Australia, The; and Australian Merino Wool Harvesting Limited. Automatic shearing device. 4,070,938, Cl. 83-71.000.
Lingl Corporation: *See*—
Lingl, Hans, 4,070,985, Cl. 118-6.000.
Lingl, Hans, to Lingl Corporation. Automatic production apparatus for manufacturing of split tile. 4,070,985, Cl. 118-6.000.
Lingle, Cleo M. Fastening bar assembly for frameless insulating panels. 4,070,848, Cl. 52-707.000.
Link, Arthur Jurgen: *See*—
Supernaw, Irwin R.; Arnold, Dan McCay; and Link, Arthur Jurgen, 4,071,755, Cl. 250-253.000.
Linner, Hans Rolf Ingemar, to AB Akerlund & Rausing. Carton storage, feeding and opening apparatus. 4,070,952, Cl. 93-53.00R.
Linz, Leonhard, to Industriewerk Schaeffler OHG. Method for producing an outer shell for overrunning clutches. 4,070,897, Cl. 72-345.000.
Lippmann, Wilbur: *See*—
Ferland, Jean-Marie; Laliberte, Real; Lippmann, Wilbur; and Pugsley, Thomas A., 4,071,552, Cl. 260-501.170.
List, Hans: *See*—
Skatsche, Othmar; Thien, Gerhard; and Fachbach, Heinz, 4,071,008, Cl. 123-198.00E.
List, William F., to Westinghouse Electric Corporation. Self-triggering circuit for gas-filled laser. 4,071,806, Cl. 315-150.000.
Litt, Kenneth Curtis, to Pace, Incorporated. Air flow control system and improved multiple position switching means for use therewith. 4,070,856, Cl. 60-407.000.
Litteral, Carl James; and Mullins, David Lee, to Union Carbide Corporation. Polysiloxane-polyoxyalkylene block copolymers as stabilizers in the production of urethane foam. 4,071,483, Cl. 260-2.5AH.
Liu, Clark Wen-Hai. Automatic insertion machine for inserting radial lead electronic components. 4,070,753, Cl. 29-741.000.
Lockheed Corporation: *See*—
Hart, John Evans, 4,071,209, Cl. 244-83.00D.
Lo Giudice, Joseph C. Bubbler display device and method of making same. 4,070,777, Cl. 40-406.000.
Lombard, Claude Edmond; and Bouvet, Jean-Marie, to Regie Nationale des Usines Renault. Electromagnetic actuator, notably for hydraulic servo-control valve. 4,071,042, Cl. 137-332.000.
Long, Henry A., Jr.: *See*—
Gross, William G.; Long, Henry A., Jr.; and Yamshak, John R., 4,070,987, Cl. 118-257.000.
Lonza, Ltd.: *See*—
Catalucci, Enrico, 4,071,550, Cl. 260-465.400.
Lorenz, Horst, to Robert Krups, Firma. Slicing machine. 4,070,941, Cl. 83-478.000.
Lorz, Werner: *See*—
Andrascheck, Hans-Joachim; Mucke, Rainer; Lorz, Werner; Borchard, Heinz; Buck, Jurgen; Knothe, Herbert; and Rybka, Bruno, 4,071,490, Cl. 260-23.0XA.
Lost River Mining Corporation Limited: *See*—
Komarek, Karl R.; and Komarek, Richard K., 4,071,595, Cl. 264-66.000.
Louzil, Friedrich: *See*—
Bretschneider, Hermann; Hueber, Herman Pieter; and Louzil, Friedrich, 4,071,716, Cl. 179-100.1DR.
Lowe, Allen D., to West Company, The. Child resistant container-closure assembly. 4,071,156, Cl. 215-224.000.
Lowman, Thomas. Inflatable leg elevator with means for applying thermal treatment. 4,071,031, Cl. 128-402.000.
Loyd, Robert W., Jr., to Curtiss-Wright Corporation. Rotary engine with combustion gas flow-back for diesel operation. 4,070,995, Cl. 123-8.110.
Lubeco, Inc.: *See*—
Jones, John R., 4,071,368, Cl. 106-38.280.
Lubrizol Corporation, The: *See*—
Dorer, Casper John, Jr., 4,071,327, Cl. 44-66.000.
Lucas Electrical Company, Limited: *See*—
Werda, Konrad, 4,071,726, Cl. 200-311.000.
Lucas Industries Limited: *See*—
Amphlett, Robert, 4,071,393, Cl. 156-353.000.
Luhr, Gerhard: *See*—
Dittrich, Wolfhart; Heuer, Helmut; Kamm, W. F. G.; Kipp, Thorwald; Luhr, Gerhard; and Poggemeier, Erich, 4,071,637, Cl. 427-12.000.
Lumbroso, Roger: *See*—
Nicou, Oliver; and Lumbroso, Roger, 4,071,431, Cl. 204-301.000.
Lummus Company, The: *See*—
Tsao, Utah, 4,071,571, Cl. 260-654.00R.
Lund, Roy F. Constant force motor. 4,070,855, Cl. 60-407.000.
Lussier, Jean Louis. Swinging door system. 4,070,795, Cl. 49-141.000.
Lvovich, Galperin Aleksandr: *See*—
Santucci, Nicola; Aleksandrovic, Zabotin Aleksandr; Dmitrievich, Loschilin Evghenii; Lvovich, Galperin Aleksandr; and Archakovich, Onikov Eduard, 4,071,053, Cl. 139-436.000.
Santucci, Nicola; Aleksandrovic, Zabotin Aleksandr; Dmitrievich, Loschilin Evghenii; Lvovich, Galperin Aleksandr; Archakovich, Onikov Eduard; Aleksandrovich, Sakharov Boris; and Alekseevich, Borodin Valerian, 4,071,054, Cl. 139-436.000.
Lynch, Jerome G.; and Quigley, William A., to UOP Inc. Method and article for protecting a precipitator discharge electrode. 4,071,688, Cl. 174-138.00R.
Maatschappij van Berkel's Patent N.V.: *See*—
Engels, Mathijs Maria Johannes, 4,070,900, Cl. 73-1.00B.
Macari, Leonard J.; and Canevari, Louis T., to Pitney-Bowes, Inc. Scale adjustment device. 4,071,104, Cl. 177-229.000.
Macintosh, Robert B. Pipe wrench jaw. 4,070,933, Cl. 81-180.00B.
Mack, Kurt: *See*—
Gorski, Theodor; Heinen, Adolf; and Mack, Kurt, 4,071,443, Cl. 210-7.000.
Madl, Joseph, Jr. Space frame structure. 4,070,847, Cl. 52-650.000.
Madland, Robert Christen, to Illinois Tool Works Inc. Keyboard switch assembly having actuator interlocking keyboard shift and shift lock and release mechanism. 4,071,719, Cl. 200-5.00B.
Maeder, Heinz Bernhard; and Schriber, Gene Arnold, to Motorola, Inc. MOS input buffer with hysteresis. 4,071,784, Cl. 307-279.000.
Maezono, Masakazu: *See*—
Hattori, Torso; and Maezono, Masakazu, 4,071,126, Cl. 192-87.120.
Magill, Gilbert W., to Aerospace General Co. Portable helicopter. 4,071,206, Cl. 244-17.110.

Maheu, Joseph S. Screw fastening device. 4,071,158, Cl. 220-3.200.
Mahler, Harry H.; and Spargo, John A. Greeting card. 4,070,778, Cl. 40-124.100.
Mahr, Rene N.: *See—*
Legille, Edouard; and Mahr, Rene N., 4,071,166, Cl. 222-1.000.
Maigret, Robert J., to Micro Components Corporation. Integrated circuit high voltage DC converter. 4,071,884, Cl. 363-21.000.
Mailki, Edward P.: *See—*
Weisser, Eugene P.; Osan, G. Alan; and Mailki, Edward P., 4,071,816, Cl. 324-30.00B.
Makin, Ronay Denton, to Thomas French and Sons (Electrical) Limited. Braided tape including carrier means. 4,070,911, Cl. 73-343.00R.
Malkani, Dalip T.: *See—*
Hague, David P.; Malkani, Dalip T.; Middlemiss, Andrew; and Scholey, Stuart, 4,070,739, Cl. 29-18.000.
Manning, Richard J., to International Laser Systems, Inc. Self-synchronizing optical imaging system. 4,071,752, Cl. 250-213.0VT.
Mannino, Anthony, Jr., to Borg-Warner Corporation. Method of forming a friction disc member. 4,071,360, Cl. 72-329.000.
Manov, Vladimir Mikhailovich: *See—*
Zarechensky, Anatoly Vasilievich; Kolechko, Alexei Afanasievich; Manov, Vladimir Mikhailovich; Korjukova, Alla Grigorievna; Savran, Vasily Grigorievich; and Serenko, Alexandr Nikitich, 4,071,734, Cl. 219-146.310.
Marathon Manufacturing Company: *See—*
Marotto, Anthony F., 4,071,215, Cl. 248-251.000.
Marie, Gerard: *See—*
de Cachard, Maurice; Moracchioli, Robert; and Marie, Gerard, 4,070,871, Cl. 62-116.000.
Marien, Jacques, to Thomson-CSF. Video color display system. 4,071,843, Cl. 343-5.0CD.
Marino, Otto M., to Labatt Breweries of Canada Limited. Apparatus for removing bottle caps. 4,070,854, Cl. 53-381.00A.
Marion Laboratories, Inc.: *See—*
Mathison, Ian William; Solomons, William Ebenezer; and Jones, Raymond Henry, 4,071,562, Cl. 260-600.00R.
Marotto, Anthony F., to Marathon Manufacturing Company. Venetian blind headrail bracket. 4,071,215, Cl. 248-251.000.
Marquardt, Julius F.: *See—*
Moreno, Emil F.; Hajek, Ralph S.; and Marquardt, Julius F., 4,070,924, Cl. 74-710.500.
Marquis, David M., to Chevron Research Company. Anhydride separation process. 4,071,540, Cl. 260-346.760.
Marrella, John Joseph: *See—*
Krajci, Gary Edward; and Marrella, John Joseph, 4,071,720, Cl. 200-6.00B.
Marsai, Maria: *See—*
Tuba, Zoltan; Marsai, Maria; Biro, Katalin; Szporny, Laszlo; Karpati, Egon; and Szeberenyi, Szabolcs, 4,071,515, Cl. 260-239.500.
Marshall, David W.; and Agarwal, Jagdish Chandra, to Kennecott Copper Corporation. Heating panel. 4,071,737, Cl. 219-345.000.
Marshall, James A., Sr. Easy cab entry and exit. 4,071,260, Cl. 280-166.000.
Martin, John: *See—*
Schuster, Albert J., Jr.; and Martin, John, 4,071,684, Cl. 544-182.000.
Martin, Michael. Apparatus for recovering paint spills. 4,071,163, Cl. 220-69.000.
Martin, Paul E.: *See—*
Fey, Maurice G.; Wolf, Charles B.; Martin, Paul E.; and Harvey, Francis J., II, 4,071,588, Cl. 264-15.000.
Martin, Ronald A.; Ashton, Charles R.; and Watson, Richard D., to General Motors Corporation. Dynamoelectric machine field assembly. 4,071,788, Cl. 310-42.000.
Marushima, Giichi; Tanaka, Hiroshi; Tosaka, Umi; Takahashi, Shinkichi; and Komiya, Takao, to Canon Kabushiki Kaisha. Electrophotographic process and apparatus. 4,071,361, Cl. 96-1.400.
Marvin Glass & Associates: *See—*
Breslow, Jeffrey D., 4,071,247, Cl. 273-308.000.
Schlau, Floyd E.; Morrison, Howard J.; and Keller, Albert G., 4,070,967, Cl. 101-301.000.
Maschinenfabrik Wifag: *See—*
Aenishaenslin, Werner; Suter, Fritz; Pfeuti, Ulrich; and Haag, Paul, 4,070,965, Cl. 101-228.000.
Masclet, Jean; and Schott, Marcel, to Messier-Hispano. Method and apparatus for effecting double-acting braking. 4,071,284, Cl. 303-63.000.
Maslakov, Petr Avramovich: *See—*
Kilin, Viktor Evdokimovich; Galimov, Anas Galimovich; Yankovsky, Oleg Alexandrovich; Klushin, Nikolai Alexandrovich; and Maslakov, Petr Avramovich, 4,071,094, Cl. 173-139.000.
Masters, Ian M.; Bolton, Gerald L.; and Sefton, Verner B., to Sherritt Gordon Mines Limited. Process for the recovery of zinc. 4,071,421, Cl. 204-96.000.
Masuda, Kosaku: *See—*
Usagawa, Yasushi; Yamashita, Kiyoshi; Nakatani, Mamoru; Masuda, Kosaku; and Kawakatsu, Satoshi, 4,071,365, Cl. 96-56.500.
Mathison, Ian William; Solomons, William Ebenezer; and Jones, Raymond Henry, to Marion Laboratories, Inc. 4,5-Dialkoxy-6 or 7-indanaldehydes. 4,071,562, Cl. 260-600.00R.
Matin, Fereidoon, to Xerox Corporation. Hammer protection circuit. 4,071,874, Cl. 361-94.000.
Matsuda, Minoru: *See—*
Yoshimura, Toshimitsu; and Matsuda, Minoru, 4,070,829, Cl. 60-290.000.
Matsunaga, Kinjiro; Nakagawa, Yunosuke; and Arai, Haruhiko, to Kao Soap Co., Ltd. Process for preparation of sodium percarbonate or sodium perborate of high specific volume. 4,071,462, Cl. 252-99.000.
Matsuno, Isao, to Fuji Jukogyo Kabushiki Kaisha. Gasoline engine of four-cycle spark ignition type. 4,070,999, Cl. 123-32.00B.
Matsuoka, Kikuo: *See—*
Miyamatsu, Yasunori; Yasumuro, Hisakazu; Miyata, Kenichi; Shimizu, Takashi; and Matsuoka, Kikuo, 4,070,885, Cl. 72-46.000.
Matsuoka, Takeshi: *See—*
Suzuki, Masane; Kanaya, Motonori; and Matsuoka, Takeshi, 4,071,291, Cl. 350-3.500.
Matsushita Electric Industrial Co., Ltd.: *See—*
Hirose, Huminori, 4,071,861, Cl. 360-96.000.
Kaminaka, Nobuyuki; Kanai, Kenji; Nouchi, Norimoto; and Nomura, Noboru, 4,071,868, Cl. 360-113.000.
Kishimoto, Yoshio, 4,071,474, Cl. 252-500.000.
Korekawa, Takashi; Kato, Nobuo; and Yamaoka, Mikio, 4,070,957, Cl. 99-455.000.
Nagata, Seiichi; Tanaka, Tsuneo; and Fukai, Masakazu, 4,071,383, Cl. 148-175.000.
Nishino, Atsushi; Sonetake, Kazunori; and Kumano, Hiroshi, 4,071,636, Cl. 427-2.000.
Yokogawa, Seiji; and Takenaka, Kiyoshi, 4,070,784, Cl. 43-17.500.
Matsushita Electrical Industrial Co., Ltd.: *See—*
Watanabe, Kaoru; and Nakayama, Syogo, 4,071,860, Cl. 360-96.000.
Mattel, Inc.: *See—*
Kimmell, Steven Donald, 4,071,256, Cl. 280-11.280.
Mattner, Paul G.; and Smith, Joseph A., to Sandoz, Inc. Preparation of 2-substituted aminophenyl ketones. 4,071,557, Cl. 260-570.0AB.
Mattson, Rodney A.: *See—*
Brunnett, Carl J.; Cox, Jerome R., Jr.; Snyder, Donald L.; and Mattson, Rodney A., 4,071,769, Cl. 250-445.00T.
Matuda, Humikazu: *See—*
Inoue, Tuyosi; Kimura, Masao; and Matuda, Humikazu, 4,071,449, Cl. 210-53.000.
Maurice, Louis: *See—*
Albertin, Michel; and Maurice, Louis, 4,071,058, Cl. 141-65.000.
Max-Planck-Gesellschaft zur Forderung der Wissenschafter e.V.: *See—*
Steinbichler, Alfred, 4,071,758, Cl. 250-277.0CH.
Maxs AG: *See—*
Braun, Werner, 4,070,955, Cl. 99-284.000.
Maxwell Laboratories, Inc.: *See—*
Kolb, Alan C.; and Drummond, James E., 4,071,334, Cl. 55-2.000.
Maxwell, Thomas J.: *See—*
Tums, Valdis M.; and Maxwell, Thomas J., 4,070,729, Cl. 17-34.000.
May & Baker Limited: *See—*
Dalton, Sally Elizabeth; Gingell, William George; Jenkins, David Conwil; King, Leslie George; Lee, Glyn Evan; and Thompson, Garth Molesdale, 4,071,528, Cl. 260-306.70T.
Mazur, Richard A., to Continental Can Co. Inc. Machine control system with machine serializing and safety circuits. 4,071,911, Cl. 364-900.000.
McBride, Thomas R.: *See—*
Covic, John; and McBride, Thomas R., 4,071,771, Cl. 250-505.000.
McCall, Samuel Leverte, Jr.: *See—*
Gibbs, Hyatt McDonald; McCall, Samuel Leverte, Jr.; and Venkatesan, Thirumalai Nallan Chakravarthy, 4,071,831, Cl. 330-4.300.
McCarty, William H.: *See—*
Guarino, John P.; and McCarty, William H., 4,071,425, Cl. 204-159.240.
McClintock, Jerry, executor: *See—*
McNaughtan, Thomas J., deceased; and McClintock, Jerry, executor, 4,070,912, Cl. 73-356.000.
McCoy, Robert M.: *See—*
Brennan, Thomas E.; Hartmann, Robert H.; and McCoy, Robert M., 4,070,750, Cl. 29-596.000.
McCubbin, John Gordon, to Alcan Research and Development Limited. Method of direct chill casting of aluminum alloys. 4,071,072, Cl. 164-89.000.
McDaniel, John H.; Sinnard, Harry W.; and Thomas, Robert W., to Caterpillar Tractor Co. Machine tool with protective light curtain and work stock holding mechanism. 4,070,940, Cl. 83-464.000.
McDonald, Bridget M. A., to I. P. U. Limited. Small movable hot deseamer. 4,071,227, Cl. 266-51.000.
McDonald, William J., to Gyro Enterprises (Rotates) Pty. Limited. Speedometer and ratio testing apparatus. 4,070,901, Cl. 73-2.000.
McDonough, Edward C.: *See—*
Eckert, Terry T.; and McDonough, Edward C., 4,071,194, Cl. 239-127.300.
McElroy, Arthur H. Apparatus for creating segmented polyethylene pipe turns. 4,071,395, Cl. 156-499.000.
McGard, Inc.: *See—*
Carl, Jack C., 4,070,880, Cl. 70-240.000.
McGee, Thomas; and Roberts, David William, to Lever Brothers Company. Fabric-softening compositions. 4,071,456, Cl. 252-8.700.
McGillvray, Bruce K.: *See—*
Boyd, Cecil E.; and McGillvray, Bruce K., 4,071,035, Cl. 131-173.000.
McGraw-Edison Company: *See—*
Thompson, Richard D.; Thompson, Douglas; and Beeley, Micheal G., 4,070,876, Cl. 68-3.00R.
McGuffin, William George, to RCA Corporation. Adaptive delta modulation system. 4,071,825, Cl. 325-38.00B.

McGuire, Robert J.: *See*—
Huffman, Charles E.; McGuire, Robert J.; and Waddill, John W., 4,071,700, Cl. 179-15.0BF.
Mchedlishvili, Boris Viktorovich: *See*—
Peradze, Tamaz Vladimirovich; Fridman, Eidlya Abramovna; Zheleznova, Nina Vsevolodovna; Kolikov, Vsevolod Mikhailovich; Bresler, Semen Khaimovich-Efimovich; Mchedlishvili, Boris Viktorovich; Molodkin, Viktor Mikhailovich; Molodkina, Ljudmila Mikhailovna; and Katushkina, Nina Vasilievna, 4,071,619, Cl. 424-90.000.
McLaughlin, Homer Charles, to Halliburton Company. Method of consolidating porous formations using vinyl polymer sealer with divinylbenzene crosslinker. 4,070,865, Cl. 61-36.00C.
McMullen, Philip B., to Goodyear Tire & Rubber Company, The. Rubber goods. 4,071,647, Cl. 428-102.000.
McNaughtan, Thomas J., deceased; and by McClintock, Jerry, executor. Temperature indicating compositions and devices. 4,070,912, Cl. 73-356.000.
McNeer, Larry M. Ultrasonic cleaning with floating transducers. 4,071,376, Cl. 134-1.000.
McRae, Daniel Dix: *See*—
Davis, Robert Curtis; and McRae, Daniel Dix, 4,071,829, Cl. 329-122.000.
Mead, Ralph T.; Greatbatch, Wilson; and Rudolph, Frank W., to Wilson Greatbatch Ltd. Lithium-iodine battery having coated anode. 4,071,662, Cl. 429-178.000.
Meador, Lawrence Dean. Method for flushing the uterus of a sow. 4,071,027, Cl. 128-231.000.
Meadors, William R., to Peerless Machine & Tool Corporation. Method for cold-forming plastic sheet. 4,071,598, Cl. 264-295.000.
Means, Rodney J.: *See*—
Daly, Thomas C.; Hepworth, Edward C.; and Means, Rodney J., 4,071,887, Cl. 364-200.000.
Mears, Whitney H.; and Orfeo, Sabatino R., to Allied Chemical Corporation. Gaseous dielectric mixtures for suppressing carbon formation. 4,071,461, Cl. 252-63.500.
Meckel, Walter; and Britain, J. W., to Mobay Chemical Corporation; and Bayer Aktiengesellschaft. Molecular weight control of polyurethane elastomers. 4,071,505, Cl. 260-77.5MA.
Medallion Instruments, Inc.: *See*—
Carpenter, William R., 4,070,909, Cl. 73-182.000.
Meiko, Inc.: *See*—
Gunzel, Rudolph M., Jr.; and Radecki, Tony, 4,071,170, Cl. 222-193.000.
Meister, John J., to Phillips Petroleum Company. Oil recovery process using viscosified surfactant. 4,071,457, Cl. 252-8.55D.
Meister, Karl: *See*—
Ingerle, Kurt; and Meister, Karl, 4,071,087, Cl. 166-278.000.
Melas, Constantine Michael: *See*—
Head, Stanley Maurice; and Melas, Constantine Michael, 4,071,903, Cl. 364-728.000.
Melle, Carl A., to PPG Industries, Inc. Apparatus for forming glass fibers. 4,071,340, Cl. 65-11.00R.
Mellows, Graham: *See*—
Barrow, Kevin David; and Mellows, Graham, 4,071,536, Cl. 260-345.80R.
Merck & Co., Inc.: *See*—
Baldwin, John J.; and Novello, Frederick C., 4,071,518, Cl. 260-256.40R.
Christensen, Burton G.; and Cama, Lovji D., 4,071,529, Cl. 260-306.70C.
Engelhardt, Edward L.; and Christy, Marcia E., 4,071,570, Cl. 260-649.00F.
Shen, Tsung-Ying; and Wagner, Arthur F., 4,071,478, Cl. 260-2.00R.
Zimmerman, Sheldon B.; and Chalmers, John H., Jr., 4,071,631, Cl. 424-263.000.
Merianos, John J.: *See*—
Petrocci, Alfonso N.; Merianos, John J.; and Green, Harold A., 4,071,628, Cl. 424-249.000.
Merki, George G. Aluminum containing alkenylbenzene resin. 4,071,668, Cl. 526-11.100.
Messer, Mayer Naoum: *See*—
Berger, Christian; Farge, Daniel; Gros, Georges; Messer, Mayer Naoum; and Moutonnier, Claude, 4,071,531, Cl. 260-327.00P.
Messier-Hispano: *See*—
Masclet, Jean; and Schott, Marcel, 4,071,284, Cl. 303-63.000.
Messing, Ralph A.; and Yaverbaum, Sidney, to Corning Glass Works. Immobilization of proteins on inorganic support materials. 4,071,409, Cl. 195-63.000.
Metallgesellschaft Aktiengesellschaft: *See*—
Hafke, Carl; and Kohlen, Rudolf, 4,071,332, Cl. 48-202.000.
Hiller, Heinz; and Fischer, Herbert, 4,071,607, Cl. 423-574.00R.
Mettler, Claudia M.: *See*—
Falender, James R.; Mettler, Claudia M.; and Saam, John C., 4,071,577, Cl. 260-827.000.
Metzger, Karl Georg: *See*—
Konig, Hans-Bodo; Metzger, Karl Georg; and Schrock, Wilfried, 4,071,683, Cl. 544-28.000.
Meyer, Yves: *See*—
Courbot, Pierre; and Meyer, Yves, 4,071,123, Cl. 188-331.000.
Meyers, Donald N.: *See*—
Piasecki, Frank N.; and Meyers, Donald N., 4,071,207, Cl. 244-23.00D.
Michael, Anthony Dennis: *See*—
Pratt, George Christopher; Eastwood, Barry John; Michael, Anthony Dennis; and Heath, Leonard, 4,071,643, Cl. 427-292.000.
Micro Components Corporation: *See*—
Maigret, Robert J., 4,071,884, Cl. 363-21.000.
Micro Pneumatic Logic Inc.: *See*—
Greene, Sanford I., 4,071,047, Cl. 137-625.180.
Middlemiss, Andrew: *See*—
Hague, David P.; Malkani, Dalip T.; Middlemiss, Andrew; and Scholey, Stuart, 4,070,739, Cl. 29-18.000.
Midland-Ross Corporation: *See*—
Dauberger, George R., 4,071,213, Cl. 248-74.00R.
Riopelle, Joseph A., 4,071,382, Cl. 148-126.000.
Mihailovski, Alexander, to Stauffer Chemical Company. Preparation of S-tricyclohexyltin-O,O-diisopropyl dithiophosphate. 4,071,545, Cl. 260-429.700.
Milberg, Morton E.; and Miller, Wayne M., to Ford Motor Company. High temperature ceramic material suitable for gas turbine applications and a process for producing same. 4,071,371, Cl. 106-65.000.
Miles Laboratories, Inc.: *See*—
Lam, Charles Tak Wai, 4,071,317, Cl. 23-253.0TP.
Lam, Charles Tak Wai, 4,071,318, Cl. 23-253.0TP.
Lam, Charles Tak Wai, 4,071,321, Cl. 23-253.0TP.
Miller, Charles R. Portable concrete proportioning mixer. 4,071,226, Cl. 366-64.000.
Miller, Homer Warner, to Honeywell Information Systems Inc. Current mode multiple-generating register. 4,071,904, Cl. 364-757.000.
Miller, Ralph H., Jr.; Dyer, William W.; Waterbury, John A.; Carlson, Wayland A.; and Eastman, Richard O., to United States of America, Navy. Quantized non-synchronous clipped speech multi-channel coded communication system. 4,071,705, Cl. 179-15.0BA.
Miller, Ralph H., Jr.; Dyer, William W.; Waterbury, John A.; Carlson, Wayland A.; and Eastman, Richard O., to United States of America, Navy. Clipped speech channel coded communication system. 4,071,826, Cl. 325-39.000.
Miller, Robert H., to Caterpillar Tractor Co. Engine start-up system and method. 4,071,010, Cl. 123-198.00F.
Miller, Robert W.; and Howell, Samuel Garry, to ARCO Polymers, Inc. Plated polypropylene composition. 4,071,656, Cl. 428-626.000.
Miller, Wayne M.: *See*—
Milberg, Morton E.; and Miller, Wayne M., 4,071,371, Cl. 106-65.000.
Milstein, Donald; and Stein, Thomas R., to Mobil Oil Corporation. Conversion of Fischer-Tropsch heavy product to high quality jet fuel. 4,071,574, Cl. 260-676.00R.
Minnesota Mining and Manufacturing Company: *See*—
Brullo, Robert A., 4,071,652, Cl. 428-323.000.
Helmer, Jack R., 4,070,969, Cl. 101-465.000.
Pfeiffer, G. William, 4,071,694, Cl. 179-1.0ST.
Minolta Camera Kabushiki Kaisha: *See*—
Ise, Katsuhiro; Kuramoto, Yoshio; and Yamazaki, Yasuo, 4,071,292, Cl. 350-128.000.
Murata, Tomoji; Nakamura, Yoshihiro; Shibazaki, Kenji; and Kuse, Matsuo, 4,071,721, Cl. 200-38.00B.
Minton, Abraham, to Gripsin Industries, Inc. Friction cosmetic gel. 4,071,374, Cl. 106-189.000.
Misono, Masayoshi; Koyama, Masaharu; and Asida, Tutomu, to Hitachi, Ltd. Method of manufacturing liquid crystal display devices. 4,070,749, Cl. 29-592.00R.
Mitchell, Richard Dale: *See*—
Boyer, David Harrison, III; and Mitchell, Richard Dale, 4,071,896, Cl. 364-471.000.
Mitchell, Richard Patrick; and Gorshe, Thomas Mathew, to American Can Company. Method and apparatus for cold lidding containers with elastomeric film. 4,070,852, Cl. 53-297.000.
Mitsubishi Chemical Industries Limited: *See*—
Kikumoto, Ryoji; Tobe, Akihiro; Tonomura, Shinji; Ikoma, Hidenobu; and Honda, Kazuo, 4,071,559, Cl. 260-570.700.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,071,621, Cl. 424-177.000.
Onoda, Takeru; and Tomita, Shimpei, 4,071,568, Cl. 260-615.00R.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Ishikawa, Riichi; and Takase, Toshio, 4,071,135, Cl. 198-324.000.
Satoh, Tsuyoshi, 4,071,714, Cl. 179-82.000.
Sumida, Shizuo; Nii, Kazuo; Shimizu, Osamu; Ueda, Atsushi; and Ishii, Mitsuaki, 4,071,889, Cl. 364-200.000.
Mitsubishi Paper Mills, Ltd.: *See*—
Usagawa, Yasushi; Yamashita, Kiyoshi; Nakatani, Mamoru; Masuda, Kosaku; and Kawakatsu, Satoshi, 4,071,365, Cl. 96-56.500.
Mitsubishi Petrochemical Company Limited: *See*—
Morikawa, Hiroyuki; and Kitazume, Shoji, 4,071,575, Cl. 260-677.00R.
Mitsugi, Koji: *See*—
Soda, Kenji; Tanaka, Hidehiko; Nakazawa, Hidetsugu; and Mitsugi, Koji, 4,071,405, Cl. 195-29.000.
Mitsuhashi, Yoshio. Tabletop directory casing with means for ready access to desired entries. 4,070,776, Cl. 40-381.000.
Mitsui Mining & Smelting Co., Ltd.: *See*—
Tokunaga, Hiroshi; Tatehana, Yoshikazu; and Umekawa, Akira, 4,071,228, Cl. 266-162.000.
Mitsui Petrochemical Industries Ltd.: *See*—
Kashiwa, Norio, 4,071,672, Cl. 526-122.000.

Kashiwa, Norio; Fuji, Saburo; and Tanaka, Masahide, 4,071,674, Cl. 526-125.000.
Mitsui, Tatsuro: *See*—
Nakagawa, Ryuichi; Yoshimatsu, Shiro; Ueda, Takuya; Fukuzawa, Akira; Ozaki, Tsuyoshi; Sato, Akira; and Mitsui, Tatsuro, 4,071,687, Cl. 13-10.000.
Mitsui Toatsu Chemicals, Incorporated: *See*—
Ozaki, Shoichiro; and Mori, Haruki, 4,071,519, Cl. 260-256.40C.
Watanabe, Hiroo; Toyoshima, Kunihiko; Noutomi, Masaru; and Yamakawa, Kouichi, 4,071,448, Cl. 210-50.000.
Miura, Sei: *See*—
Nishikubo, Michio; Miura, Sei; Toyoda, Toshiaki; Jonishi, Katsunori; and Yoneta, Kouichi, 4,070,893, Cl. 72-234.000.
Miyakawa, Seii; Kobayashi, Takashi; Kishi, Masaya; and Ogiro, Kenji, to Hitachi, Ltd. Apparatus for mounting tension coil spring onto article. 4,070,743, Cl. 29-227.000.
Miyamatsu, Yasunori; Yasumuro, Hisakazu; Miyata, Kenichi; Shimizu, Takashi; and Matsuoka, Kikuo, to Toyo Seikan Kaisha Limited. Apparatus for simultaneously deforming and coating. 4,070,885, Cl. 72-46.000.
Miyamoto, Koichi: *See*—
Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, 4,071,295, Cl. 355-3.0SH.
Miyata, Kenichi: *See*—
Miyamatsu, Yasunori; Yasumuro, Hisakazu; Miyata, Kenichi; Shimizu, Takashi; and Matsuoka, Kikuo, 4,070,885, Cl. 72-46.000.
Mobay Chemical Corporation: *See*—
Meckel, Walter; and Britain, J. W., 4,071,505, Cl. 260-77.5MA.
Mobil Oil Corporation: *See*—
Chen, Nai Yuen, 4,070,993, Cl. 123-3.000.
Guarino, John P.; and McCarty, William H., 4,071,425, Cl. 204-159.240.
Milstein, Donald; and Stein, Thomas R., 4,071,574, Cl. 260-676.00R.
Owen, Hartley; and Venuto, Paul B., 4,071,573, Cl. 260-668.00R.
Zemanek, Joseph, Jr., 4,071,815, Cl. 324-8.000.
Mocarski, Stanislaw, to Ford Motor Company. Master alloy for powders. 4,071,354, Cl. 75-.5OR.
Moed, Johannes A. R., to TRW, Inc. Service generator checking apparatus. 4,071,704, Cl. 179-15.0BF.
Moehle, Kenneth Albert: *See*—
Reinhardt, Jack; Moehle, Kenneth Albert; and Hinke, Jerald Dietrich, 4,070,914, Cl. 74-475.000.
Molis, Stephen J.: *See*—
Darby, William L.; Monz, Robert H.; and Molis, Stephen J., 4,071,790, Cl. 310-59.000.
Molleken, Reiner: *See*—
Bauer, Kurt; Molleken, Reiner; and Exner, Fritz, 4,071,564, Cl. 260-613.00D.
Molodkin, Viktor Mikhailovich: *See*—
Peradze, Tamaz Vladimirovich; Fridman, Eidlya Abramovna; Zheleznova, Nina Vsevolodovna; Kolikov, Vsevolod Mikhailovich; Bresler, Semen Khaimovich-Efimovich; Mchedlishvili, Boris Viktorovich; Molodkin, Viktor Mikhailovich; Molodkina, Ljudmila Mikhailovna; and Katushkina, Nina Vasilievna, 4,071,619, Cl. 424-90.000.
Molodkina, Ljudmila Mikhailovna: *See*—
Peradze, Tamaz Vladimirovich; Fridman, Eidlya Abramovna; Zheleznova, Nina Vsevolodovna; Kolikov, Vsevolod Mikhailovich; Bresler, Semen Khaimovich-Efimovich; Mchedlishvili, Boris Viktorovich; Molodkin, Viktor Mikhailovich; Molodkina, Ljudmila Mikhailovna; and Katushkina, Nina Vasilievna, 4,071,619, Cl. 424-90.000.
Monogram Industries, Inc.: *See*—
Bishton, Norris J., Jr.; Rod, Robert L.; Wagenhals, Bruce; Woltanski, Theodore M.; and Blick, John S., III, 4,070,714, Cl. 4-318.000.
Monsanto Company: *See*—
Birum, Gail H., 4,071,584, Cl. 260-932.000.
Wagenknecht, John H.; and Laurin, Dean G., 4,071,429, Cl. 204-231.000.
Wilson, Glenn R., 4,071,549, Cl. 260-465.80R.
Monz, Robert H.: *See*—
Darby, William L.; Monz, Robert H.; and Molis, Stephen J., 4,071,790, Cl. 310-59.000.
Moog, Gerhard W.; and Cooper, Kenneth R., to Canada Square Management Ltd. Heating system for building. 4,071,077, Cl. 165-18.000.
Moomey, Henry E., Jr., to Shuster, James C.; and Brinks, William G., part interest to each. Suspended ceiling construction. 4,070,840, Cl. 52-489.000.
Moore Business Forms, Inc.: *See*—
D'Luhy, Emil A., 4,071,142, Cl. 206-629.000.
Williams, Rodney E., 4,071,646, Cl. 427-358.000.
Moracchioli, Robert: *See*—
de Cachard, Maurice; Moracchioli, Robert; and Marie, Gerard, 4,070,871, Cl. 62-116.000.
Moran, David Patrick Joseph: *See*—
Wilton, Inga Elna Maria; Envall, Lennart Olof Gunnemar; Sundstroem, Kurt Lage; and Moran, David Patrick Joseph, 4,071,634, Cl. 426-604.000.
Moran, George A., Jr.; and Sitton, Willard J., to ACF Industries, Incorporated. Ball valve seat ring construction. 4,071,041, Cl. 137-246.220.
Moreno, Emil F.; Hajek, Ralph S.; and Marquardt, Julius F., to International Harvester Company. Automatic control of lockable differentials. 4,070,924, Cl. 74-710.500.
Morey, Booker W., to Occidental Petroleum Corporation. Method and apparatus for recovery of aluminum from solid waste. 4,071,442, Cl. 209-212.000.
Morgan, Charles W., to Dow Chemical Company, The. Cushioning element. 4,070,719, Cl. 5-355.000.
Morgan Construction Company: *See*—
Salter, Lowell S., Jr., 4,071,255, Cl. 277-57.000.
Morgan, Jerome. Mechanized display device. 4,070,973, Cl. 108-20.000.
Morgan Refractories Limited: *See*—
Errington, Paul Anthony, 4,071,311, Cl. 432-234.000.
Morganstern, Michael D.: *See*—
Stockebrand, Thomas C.; Doane, Russell C.; and Morganstern, Michael D., 4,071,910, Cl. 364-900.000.
Mori, Haruki: *See*—
Ozaki, Shoichiro; and Mori, Haruki, 4,071,519, Cl. 260-256.40C.
Moriarty, Lawrence James, to North Electric Company. Water-proof air-pressure equalizing valve. 4,071,040, Cl. 137-199.000.
Morikawa, Hiroyuki; and Kitazume, Shoji, to Mitsubishi Petrochemical Company Limited. Process for producing 2,6-dimethyl-1,3,6-octatriene. 4,071,575, Cl. 260-677.00R.
Morio, Minoru: *See*—
Kihara, Nobutoshi; and Morio, Minoru, 4,071,856, Cl. 360-73.000.
Morris, Carlisle S., to Caterpillar Tractor Co. Motor grader with detachable link for reduced blade angle operation. 4,071,091, Cl. 172-797.000.
Morrison, Howard J.: *See*—
Schlau, Floyd E.; Morrison, Howard J.; and Keller, Albert G., 4,070,967, Cl. 101-301.000.
Morton-Norwich Products, Inc.: *See*—
Butterfield, James L.; and Wright, George C., 4,071,632, Cl. 424-263.000.
Morton, William David, Jr., to Bourns, Inc. Document hold-down device. 4,071,233, Cl. 271-8.00R.
Moser, Horst: *See*—
Fidi, Werner; and Moser, Horst, 4,071,717, Cl. 179-182.00R.
Moser, Rabin, to Xerox Corporation. Externally heated low-power roll fuser. 4,071,735, Cl. 219-216.000.
Motomura, Mitsuteru; Kojima, Chiaki; Ohta, Hiroshi; and Nemoto, Akira, to Kabushiki Kaisha Komatsu Seisakusho. Ground excavating apparatus. 4,070,772, Cl. 37-117.500.
Motorola, Inc.: *See*—
Daly, Thomas C.; Hepworth, Edward C.; and Means, Rodney J., 4,071,887, Cl. 364-200.000.
Estreicher, Isabelle E.; and Price, James B., 4,071,397, Cl. 156-662.000.
Huntington, Robert Charles, 4,071,830, Cl. 330-277.000.
Krajci, Gary Edward; and Marrella, John Joseph, 4,071,720, Cl. 200-6.00B.
Maeder, Heinz Bernhard; and Schriber, Gene Arnold, 4,071,784, Cl. 307-279.000.
Mott, James D., to Hydril Company. Retrievable safety valve. 4,071,088, Cl. 166-321.000.
Mountford, George S., to A-T-O Inc. Adjustable drop nipple. 4,071,266, Cl. 285-14.000.
Moutonnier, Claude: *See*—
Berger, Christian; Farge, Daniel; Gros, Georges; Messer, Mayer Naoum; and Moutonnier, Claude, 4,071,531, Cl. 260-327.00P.
Moyer, John W. Slide storing apparatus. 4,071,286, Cl. 312-330.00R.
MTA Kozponti Kemiai Kutato Intezet: *See*—
Kalman, Erika; Haklik, Lajos; Eke, Anna; and Kovacs, Pal, 4,071,766, Cl. 250-443.000.
Muccino, Richard R.: *See*—
Christenson, James Gordon; and Muccino, Richard R., 4,071,522, Cl. 260-292.000.
Mucke, Rainer: *See*—
Andrascheck, Hans-Joachim; Mucke, Rainer; Lorz, Werner; Borchard, Heinz; Buck, Jurgen; Knothe, Herbert; and Rybka, Bruno, 4,071,490, Cl. 260-23.0XA.
Muench, Terry G., to Dow Chemical Company, The. Process for making 2,6-difluoro pyridine. 4,071,521, Cl. 260-290.0HL.
Muhlfelder, Ludwig; Keigler, John Edward; and Stewart, Brian, to RCA Corporation. Momentum biased active three-axis satellite attitude control system. 4,071,211, Cl. 244-165.000.
Muhlhaus, Ludwig: *See*—
Weyer, Horst; Muhlhaus, Ludwig; and Oberschachtsiek, Gerhard, 4,071,612, Cl. 423-659.000.
Mukaihara, Yoshitaka: *See*—
Amano, Tadashi; Mukaihara, Yoshitaka; and Nakamura, Tadashi, 4,071,299, Cl. 356-202.000.
Mukunashi, Hiroaki: *See*—
Usui, Kuniharu; Shimba, Hiroshi; Nakagaki, Kunihiro; and Mukunashi, Hiroaki, 4,071,388, Cl. 156-157.000.
Mulder, Jan Louis: *See*—
Carlsson, Lars Ake Ingemar; and Mulder, Jan Louis, 4,071,510, Cl. 260-112.50R.
Mullen, Richard V.: *See*—
Kuhns, Garrett D.; Astorp, Norman E.; Mullen, Richard V.; and Thomas, John Ellwood, 4,071,195, Cl. 239-289.000.
Muller, Alexander: *See*—
Ummen, Arnulf; and Muller, Alexander, 4,070,919, Cl. 74-229.000.
Mullins, David Lee: *See*—
Litteral, Carl James; and Mullins, David Lee, 4,071,483, Cl. 260-2.5AH.

Multi-Pak Corporation: *See*—
O'Rourke, James; and Feldberg, Murray, 4,070,961, Cl. 100-185.000.

Murata, Tomoji; Nakamura, Yoshihiro; Shibazaki, Kenji; and Kuse, Matsuo, to Minolta Camera Kabushiki Kaisha. Sequential controller. 4,071,721, Cl. 200-38.00B.

Murray, Robert Maclay: *See*—
Hogendobler, Richard Shure; and Murray, Robert Maclay, 4,070,751, Cl. 29-628.000.

Mushinsky, Albert J., to Alton Corporation. Measurement system. 4,071,820, Cl. 324-61.00R.

Musil, Ivan: *See*—
Zouhar, Drahomir; Holas, Antonin; and Musil, Ivan, 4,070,874, Cl. 66-177.000.

Mutke, H. Guido. Arrangement for the transportation of persons in a recumbent position in particular in aircraft. 4,071,210, Cl. 244-118.00P.

Mutoh Industry Ltd.: *See*—
Watanabe, Yoshinori, 4,070,758, Cl. 33-76.00R.

Myers, James Lewis, to Coors Container Company. Tribo-electro-gas-dynamic powder charging apparatus. 4,071,192, Cl. 239-3.000.

N L Industries, Inc.: *See*—
Rutt, Truman C., 4,071,880, Cl. 361-309.000.
Stynes, James A., 4,071,878, Cl. 361-307.000.

Nagase, Toshiro, to Tokico Ltd. Method for filling gas into sealed cylinder device. 4,071,057, Cl. 141-4.000.

Nagata, Seiichi; Tanaka, Tsuneo; and Fukai, Masakazu, to Matsushita Electric Industrial Co., Ltd. Process for fabrication of dielectric optical waveguide devices. 4,071,383, Cl. 148-175.000.

Naik, Appayya Raghunath: *See*—
Evans, William Price; and Naik, Appayya Raghunath, 4,071,523, Cl. 260-293.760.

Naka, Hisayoshi: *See*—
Ishibe, Shuhei; Okumichi, Toshiharu; Ishihara, Yasushi; and Naka, Hisayoshi, 4,071,375, Cl. 106-238.000.

Nakagaki, Kunihiro: *See*—
Usui, Kuniharu; Shimba, Hiroshi; Nakagaki, Kunihiro; and Mukunashi, Hiroaki, 4,071,388, Cl. 156-157.000.

Nakagawa, Ryuichi; Yoshimatsu, Shiro; Ueda, Takuya; Fukuzawa, Akira; Ozaki, Tsuyoshi; Sato, Akira; and Mitsui, Tatsuro, to National Research Institute for Metals. Electric arc furnace for continuous melting of directly reduced iron or directly reduced iron ore. 4,071,687, Cl. 13-10.000.

Nakagawa, Yunosuke: *See*—
Matsunaga, Kinjiro; Nakagawa, Yunosuke; and Arai, Haruhiko, 4,071,462, Cl. 252-99.000.

Nakagomi, Yoshiyuki, to Hitachi, Ltd. Analog operation circuit using a multi-collector lateral transistor. 4,071,778, Cl. 307-229.000.

Nakaguti, Osamu: *See*—
Kamiya, Takashi; Teraji, Tsutomu Toyonaka; Hashimoto, Masashi; Oku, Teruo Kyoto; Nakaguti, Osamu; Saito, Yoshihisa; and Nakamura, Hitoshi, 4,071,527, Cl. 260-306.500.

Nakai, Masanori: *See*—
Tokumaru, Yukuya; and Nakai, Masanori, 4,071,774, Cl. 307-215.000.

Nakajima, Yasuo; and Hayashi, Yoshimasa, to Nissan Motor Co., Ltd. Internal combustion engine equipped with improved exhaust gas recirculation system. 4,071,005, Cl. 123-119.00A.

Nakamura, Hitoshi: *See*—
Kamiya, Takashi; Teraji, Tsutomu Toyonaka; Hashimoto, Masashi; Oku, Teruo Kyoto; Nakaguti, Osamu; Saito, Yoshihisa; and Nakamura, Hitoshi, 4,071,527, Cl. 260-306.500.

Nakamura, Matsuaki: *See*—
Ogawa, Hiroshi; Ishii, Kazuhide; Nakamura, Matsuaki; Tamai, Yasuo; and Akashi, Goro, 4,071,654, Cl. 428-336.000.

Nakamura, Norihiko: *See*—
Konishi, Masami; Nakamura, Norihiko; Itou, Takaaki; and Kikuchi, Kazuo, 4,071,585, Cl. 261-36.00A.

Nakamura, Tadashi: *See*—
Amano, Tadashi; Mukaihara, Yoshitaka; and Nakamura, Tadashi, 4,071,299, Cl. 356-202.000.

Nakamura, Yoshihiro: *See*—
Murata, Tomoji; Nakamura, Yoshihiro; Shibazaki, Kenji; and Kuse, Matsuo, 4,071,721, Cl. 200-38.00B.

Nakao, Hideo: *See*—
Yanagisawa, Hiroaki; Ando, Akiko; Fukushima, Masami; and Nakao, Hideo, 4,071,681, Cl. 542-420.000.

Nakasuna, Seikoh, to Hitachi, Ltd. Cassette tape recorder. 4,071,865, Cl. 360-105.000.

Nakatani, Mamoru: *See*—
Usagawa, Yasushi; Yamashita, Kiyoshi; Nakatani, Mamoru; Masuda, Kosaku; and Kawakatsu, Satoshi, 4,071,365, Cl. 96-56.500.

Nakayama, Syogo: *See*—
Watanabe, Kaoru; and Nakayama, Syogo, 4,071,860, Cl. 360-96.000.

Nakazawa, Hidetsugu: *See*—
Soda, Kenji; Tanaka, Hidehiko; Nakazawa, Hidetsugu; and Mitsugi, Koji, 4,071,405, Cl. 195-29.000.

Namae, Takao, to Nihon Denshi Kabushiki Kaisha. Scanning electron device. 4,071,759, Cl. 250-310.000.

Nashua Corporation: *See*—
Lathrop, Francis O., Jr.; Jacobs, Edward H.; Wood, William E.; and Taylor, Patrick A., 4,071,862, Cl. 360-97.000.

National Distillers and Chemical Corporation: *See*—
Platz, Gerald M.; and Walkup, Norris W., 4,071,325, Cl. 23-290.000.

National Geographic Society: *See*—
Schaeffer, Merle J., 4,071,066, Cl. 150-52.00J.

National Research Institute for Metals: *See*—
Nakagawa, Ryuichi; Yoshimatsu, Shiro; Ueda, Takuya; Fukuzawa, Akira; Ozaki, Tsuyoshi; Sato, Akira; and Mitsui, Tatsuro, 4,071,687, Cl. 13-10.000.

National Semiconductor Corporation: *See*—
Dobkin, Robert C., 4,071,813, Cl. 323-8.000.

Nawracaj, Edward P.; and Greit, Henry A. Electrotherapeutic device with modulated dual signals. 4,071,033, Cl. 128-420.00A.

NCR Corporation: *See*—
Stewart, John W.; and Bruckner, Ronald L., 4,071,877, Cl. 361-152.000.

Ned Strongin Associates, Inc.: *See*—
Strongin, Ned; and Garrett, Isabel, 4,070,790, Cl. 46-172.000.

Negishi, Takao; and Tomiita, Kazuo, to Toray Industries, Inc. Textured multifilament yarn. 4,070,815, Cl. 57-140.00J.

Nelle, Gunther, to Dr. Johannes Heidenhain GmbH. Sealed incremental measuring device having an articulated fastening means for mounting the housing. 4,070,759, Cl. 33-125.00C.

Nelson, Robert Wayne: *See*—
Crouch, Donald Wayne; and Nelson, Robert Wayne, 4,071,727, Cl. 200-144.00B.

Nemcek, Josef: *See*—
Dart, Edward Charles; and Nemcek, Josef, 4,071,424, Cl. 204-159.150.

Nemoto, Akira: *See*—
Motomura, Mitsuteru; Kojima, Chiaki; Ohta, Hiroshi; and Nemoto, Akira, 4,070,772, Cl. 37-117.500.

Neuberg, Dave: *See*—
Satt, Henry; and Neuberg, Dave, 4,070,716, Cl. 5-99.00C.

Neumeister, Alvin W., to Goodyear Tire & Rubber Company, The. Edge control for calender covering industrial belting. 4,070,939, Cl. 83-368.000.

New Jersey Zinc Company, The: *See*—
Robinson, Victor S., 4,071,609, Cl. 423-622.000.

Newell, Stanley Ernest, to Boeing Company, The. Anemometer compensator linearizer. 4,070,908, Cl. 73-170.00R.

Newnom, Richard S., to Amerace Corporation. Apparatus for making self-locking internally threaded fasteners with ring-like locking elements. 4,070,724, Cl. 10-162.00R.

Nezu, Yukio: *See*—
Hayashi, Eiichi; Takita, Kiyoshi; Sugiyama, Hironari; and Nezu, Yukio, 4,071,534, Cl. 260-343.700.

Nichols, Roy A.; and Anderson, Francis L. Self-pasting toothbrush. 4,071,300, Cl. 401-175.000.

Nicks, Larry J.: *See*—
Atkinson, Gary B.; and Nicks, Larry J., 4,071,473, Cl. 252-462.000.

Nicou, Oliver; and Lumbroso, Roger, to Socomaten. Installation for the treatment of metals pickling solutions. 4,071,431, Cl. 204-301.000.

Nifco Inc.: *See*—
Kurosaki, Mutsuo, 4,070,945, Cl. 85-80.000.

Nihon Denshi Kabushiki Kaisha: *See*—
Namae, Takao, 4,071,759, Cl. 250-310.000.

Nii, Kazuo: *See*—
Sumida, Shizuo; Nii, Kazuo; Shimizu, Osamu; Ueda, Atsushi; and Ishii, Mitsuaki, 4,071,889, Cl. 364-200.000.

Niklas, Ludwig; and Walker, Philip A., to Krautkramer-Branson, Incorporated. Ultrasonic pulse-echo thickness and velocity measuring method. 4,070,917, Cl. 73-598.000.

Nippert Company, The: *See*—
Nippert, Russell A., 4,071,796, Cl. 310-236.000.

Nippert, Russell A., to Nippert Company, The. Double insulated commutator. 4,071,796, Cl. 310-236.000.

Nippon Electric Co., Ltd.: *See*—
Koike, Shin'ichi; Hayashi, Seijiro; and Takayama, Michio, 4,071,827, Cl. 325-42.000.
Oguchi, Tetsuji; and Kawai, Hirokazu, 4,071,905, Cl. 364-784.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Aoki, Eiichiro, 4,070,942, Cl. 84-1.010.

Nippon Kokan Kabushiki Kaisha: *See*—
Tanaka, Jinkichi; and Watanabe, Itaru, 4,071,732, Cl. 219-137.00R.

Nippon Oil Co., Ltd.: *See*—
Yokoyama, Nobuo, 4,071,581, Cl. 260-878.00R.

Nippon Paint Co., Ltd.: *See*—
Inoue, Tuyosi; Kimura, Masao; and Matuda, Humikazu, 4,071,449, Cl. 210-53.000.

Nippon Petrochemicals Co. Ltd.: *See*—
Kobayashi, Seizo; Hirayama, Toshiharu; Kamiya, Takeshi; Kezuka, Seiju; and Takeuchi, Hidesuke, 4,071,591, Cl. 264-45.300.

Nippon Steel Corporation: *See*—
Nishikubo, Michio; Miura, Sei; Toyoda, Toshiaki; Jonishi, Katsunori; and Yoneta, Kouichi, 4,070,893, Cl. 72-234.000.
Yamamoto, Satomi; and Yoshii, Masataka, 4,071,356, Cl. 75-59.000.

Nishikubo, Michio; Miura, Sei; Toyoda, Toshiaki; Jonishi, Katsunori; and Yoneta, Kouichi, to Nippon Steel Corporation. Finish rolling method for production of round cross-sectional shape materials. 4,070,893, Cl. 72-234.000.

Nishino, Atsushi; Sonetake, Kazunori; and Kumano, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Method of producing sheet-formed bactericidal article. 4,071,636, Cl. 427-2.000.

Nissan Motor Co., Ltd.: *See*—
Aono, Shigeo, 4,071,003, Cl. 123-119.00A.
Ezoe, Mitsuhiko, 4,071,109, Cl. 180-143.000.
Harada, Ietsuya, 4,071,006, Cl. 123-119.00A.

Nakajima, Yasuo; and Hayashi, Yoshimasa, 4,071,005, Cl. 123-119.00A.
Sakaki, Yoshihiro, 4,071,076, Cl. 165-9.000.
Nisshin Oil Mills, Ltd., The: *See—*
Kanda, Hiroshi, 4,071,406, Cl. 195-31.00P.
Nomura, Noboru: *See—*
Kaminaka, Nobuyuki; Kanai, Kenji; Nouchi, Norimoto; and Nomura, Noboru, 4,071,868, Cl. 360-113.000.
Nordgren, Robert, to General Mills Chemicals, Inc. Self-complexing galactomannan gums. 4,071,467, Cl. 252-316.000.
Nordiska Maskinfilt Aktiebolaget: *See—*
Codorniu, Francisco Lorente, 4,071,050, Cl. 139-383.00R.
North American Philips Corporation: *See—*
Kok, Pieter Willem, 4,071,231, Cl. 269-325.000.
Liebert, Richard B., 4,071,430, Cl. 204-299.00R.
North Electric Company: *See—*
Moriarty, Lawrence James, 4,071,040, Cl. 137-199.000.
North, Steven Forrest: *See—*
Broyde, Barret; Delles, Judith Archer; and North, Steven Forrest, 4,071,479, Cl. 260-2.300.
Northern Telecom Limited: *See—*
Dupuis, Jean Marcel, 4,071,180, Cl. 228-1.00R.
Kayalioglu, Inanc, 4,071,781, Cl. 307-265.000.
Sencer, Mevhibe Gulay, 4,071,713, Cl. 179-81.00A.
Norton Company: *See—*
Scott, John J., 4,070,796, Cl. 51-309.00R.
Nouchi, Norimoto: *See—*
Kaminaka, Nobuyuki; Kanai, Kenji; Nouchi, Norimoto; and Nomura, Noboru, 4,071,868, Cl. 360-113.000.
Noutomi, Masaru: *See—*
Watanabe, Hiroo; Toyoshima, Kunihiko; Noutomi, Masaru; and Yamakawa, Kouichi, 4,071,448, Cl. 210-50.000.
Nova-Lux-Gesellschaft Brandenburg & Co.: *See—*
Schneppendahl, Richard; Kramer, Heinrich; and Pepping, Franz, 4,071,750, Cl. 362-217.000.
Novello, Frederick C.: *See—*
Baldwin, John J.; and Novello, Frederick C., 4,071,518, Cl. 260-256.40R.
Nowack, Gerhard P.: *See—*
Johnson, Marvin M.; and Nowack, Gerhard P., 4,071,331, Cl. 48-197.00R.
NTN Toyo Bearing Co. Ltd.: *See—*
Deguchi, Osamu, 4,071,149, Cl. 214-6.00P.
Nugent, Edward L., to Becton, Dickinson and Company. Contaminant detector. 4,071,319, Cl. 23-254.00R.
Nunez Fuentes, Cayetano, to Ingeniera Aplicada, S.A. (INAPSA). Gripper holder bands driving mechanism for shuttleless looms. 4,070,918, Cl. 74-70.000.
Nuovo Pignone S.p.A.: *See—*
Di Sciascio, Nicola; and Vinci, Michele, 4,071,221, Cl. 251-228.000.
Santucci, Nicola; Aleksandrovic, Zabotin Aleksandr; Dmitrievich, Loschilin Evghenii; Lvovich, Galperin Aleksandr; and Archakovich, Onikov Eduard, 4,071,053, Cl. 139-436.000.
Santucci, Nicola; Aleksandrovic, Zabotin Aleksandr; Dmitrievich, Loschilin Evghenii; Lvovich, Galperin Aleksandr; Archakovich, Onikov Eduard; Aleksandrovich, Sakharov Boris; and Alekseevich, Borodin Valerian, 4,071,054, Cl. 139-436.000.
Nyi, Kayson: *See—*
Emmons, William D.; Nyi, Kayson; and Sperry, Peter R., 4,071,489, Cl. 260-22.0CB.
Nyssen, Adrianus Marinus. Spiral pipe forming machine with device for aligning spiralling rolls. 4,070,886, Cl. 72-49.000.
Oakes, George W. Rodent trap. 4,070,787, Cl. 43-94.000.
Obara, Hiroshi: *See—*
Yoshida, Masafumi; and Obara, Hiroshi, 4,071,785, Cl. 310-331.000.
Oberschachtsiek, Gerhard: *See—*
Weyer, Horst; Muhlhaus, Ludwig; and Oberschachtsiek, Gerhard, 4,071,612, Cl. 423-659.000.
O'Blasny, Richard H., to Vacsol Corporation. Method of reclaiming waste oil by distillation and extraction. 4,071,438, Cl. 208-180.000.
Occidental Petroleum Corporation: *See—*
Knell, Everett W.; and Green, Norman W., 4,071,432, Cl. 208-8.000.
Morey, Booker W., 4,071,442, Cl. 209-212.000.
Odom, James Thomas, to A. B. Chance Company. Spring-biased take-up clamp assembly for mobile home tie-down straps. 4,070,802, Cl. 52-23.000.
Oertle, Donald H., to Continental Oil Company. Port closure apparatus for differentially pressured vessels. 4,071,011, Cl. 137-317.000.
Ofa AG: *See—*
Hamel, Edmund, 4,070,818, Cl. 57-160.000.
O'Farrell, James T.: *See—*
Wood, Kenneth E.; and O'Farrell, James T., 4,071,895, Cl. 364-449.000.
Off, Joseph W. A.; and Early, Judson Horace, to Haggar Company. Belt loop trimming apparatus. 4,070,937, Cl. 83-27.000.
Offermann, Wilhelm: *See—*
Linden, Heinz; Gress, Wolfgang; and Offermann, Wilhelm, 4,071,487, Cl. 260-22.0TN.
Ogawa, Hiroshi; Ishii, Kazuhide; Nakamura, Matsuaki; Tamai, Yasuo; and Akashi, Goro, to Fuji Photo Film Co., Ltd. Magnetic recording member. 4,071,654, Cl. 428-336.000.
Ogiro, Kenji: *See—*
Miyakawa, Seii; Kobayashi, Takashi; Kishi, Masaya; and Ogiro, Kenji, 4,070,743, Cl. 29-227.000.
Oguchi, Tetsuji; and Kawai, Hirokazu, to Nippon Electric Co., Ltd. Full adder/subtractor circuit employing exclusive OR logic. 4,071,905, Cl. 364-784.000.
Ohhinata, Ichiro: *See—*
Kawanami, Mitsuru; Ohhinata, Ichiro; and Okuhara, Shinzi, 4,071,779, Cl. 307-255.000.
Ohio-Nuclear, Inc.: *See—*
Covic, John; and McBride, Thomas R., 4,071,771, Cl. 250-505.000.
Ohkubo, Kazuo: *See—*
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,071,621, Cl. 424-177.000.
Ohmori, Akio: *See—*
Yamamoto, Kohzo; Kawai, Syuji; and Ohmori, Akio, 4,071,454, Cl. 210-321.00A.
Ohta, Hiroshi: *See—*
Motomura, Mitsuteru; Kojima, Chiaki; Ohta, Hiroshi; and Nemoto, Akira, 4,070,772, Cl. 37-117.500.
Oka, Katsuhiko, to Asahi Fancy Plywood Co., Ltd. Method of reinforcing porous materials. 4,071,642, Cl. 427-243.000.
Okamoto, Nobukazu, to Toa Nenryo Kogyo Kabushiki Kaisha. Lubricating oil additive, process for the synthesis thereof and lubricating oil additive composition. 4,071,548, Cl. 260-462.00R.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, to Mitsubishi Chemical Industries Limited; and Okamoto, Shosuke. N^2-alkoxynaphthalenesulfonyl-L-argininamides and the pharmaceutically acceptable salts thereof. 4,071,621, Cl. 424-177.000.
Okayama, Tsutomu, to Hitachi, Ltd. Two-wire type amplifier. 4,071,823, Cl. 324-123.00R.
Oki Electric Industry Co., Ltd.: *See—*
Koyano, Hitoshi; Sugaya, Nobuo; and Shiraogawa, Michio, 4,071,849, Cl. 346-1.000.
Oki, Toshikazu: *See—*
Umezawa, Hamao; Takeuchi, Tomio; Hamada, Masa; Takamatsu, Akira; and Oki, Toshikazu, 4,071,411, Cl. 195-80.00R.
Okiyama, Toshiaki: *See—*
Takenaka, Haruo; Okiyama, Toshiaki; and Kawamata, Toshio, 4,071,362, Cl. 96-1.400.
Oku, Teruo Kyoto: *See—*
Kamiya, Takashi; Teraji, Tsutomu Toyonaka; Hashimoto, Masashi; Oku, Teruo Kyoto; Nakaguti, Osamu; Saito, Yoshihisa; and Nakamura, Hitoshi, 4,071,527, Cl. 260-306.500.
Okuhara, Shinzi: *See—*
Kawanami, Mitsuru; Ohhinata, Ichiro; and Okuhara, Shinzi, 4,071,779, Cl. 307-255.000.
Okumichi, Toshiharu: *See—*
Ishibe, Shuhei; Okumichi, Toshiharu; Ishihara, Yasushi; and Naka, Hisayoshi, 4,071,375, Cl. 106-238.000.
Okura, Zenichi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Camera lens barrel suitable for flash photography. 4,071,850, Cl. 354-196.000.
Olin Corporation: *See—*
Cheskis, Harvey P.; Shapiro, Stanley; and Crane, Jacob, 4,071,359, Cl. 75-160.000.
Wojtowicz, John A., 4,071,605, Cl. 423-462.000.
Olsen, Emil Adolph: *See—*
Granberg, Elof; and Olsen, Emil Adolph, 4,070,757, Cl. 30-371.000.
Olsen, Richard J., to Goodyear Tire & Rubber Company, The. Removable track belt with removable keeper bar. 4,071,068, Cl. 152-176.000.
Olson, Gary Lee, to Hoffmann-La Roche Inc. Pyran aldehydes. 4,071,538, Cl. 260-345.90R.
Oltman, Henry G., Jr., to Hughes Aircraft Company. Wired microstrip linear array of dipoles. 4,071,846, Cl. 343-700.0MS.
Olympic Engineering Co.: *See—*
Ball, Harry, 4,071,394, Cl. 156-465.000.
Olympus Optical Company, Ltd.: *See—*
Kato, Yutaka; Ouchi, Teruo; and Koshiishi, Kiyozo, 4,070,986, Cl. 118-7.000.
O'Neal, Larry. Flexible dock seal. 4,070,801, Cl. 52-2.000.
Ono, Koichi: *See—*
Konobe, Takeo; Onoda, Tetsuo; and Ono, Koichi, 4,071,618, Cl. 424-89.000.
Ono Pharmaceutical Co., Ltd.: *See—*
Takahashi, Zyuro; and Hayashi, Chozo, 4,071,413, Cl. 195-103.50R.
Onoda, Takeru; and Tomita, Shimpei, to Mitsubishi Chemical Industries Limited. Process for producing glycol monoether. 4,071,568, Cl. 260-615.00R.
Onoda, Tetsuo: *See—*
Konobe, Takeo; Onoda, Tetsuo; and Ono, Koichi, 4,071,618, Cl. 424-89.000.
Oosterhouse, Michael Jay: *See—*
Dalton, Thomas B.; Pyatt, Theodore Wayne; and Oosterhouse, Michael Jay, 4,071,274, Cl. 296-35.00A.
Oosterwijk, Hendrik Harm Jannes, to Akzona Incorporated. Novel peresters suitable for initiating the polymerization or copolymerization of ethylenically unsaturated compounds. 4,071,579, Cl. 260-866.000.
Ootsu, Fumio. Transducer for conversion of tidal current energy. 4,071,305, Cl. 417-334.000.
Oprean, George. Swimmer's drag suit. 4,071,236, Cl. 272-116.000.
Oprins, John A. E., to Ideal Industries Inc. Wire stripper. 4,070,930, Cl. 81-9.50B.
Orfeo, Sabatino R.: *See—*
Mears, Whitney H.; and Orfeo, Sabatino R., 4,071,461, Cl. 252-63.500.

Oriani, Gianni: *See—*
Ancillotti, Francesco; Oriani, Gianni; and Pescarollo, Ermanno, 4,071,567, Cl. 260-614.00A.
O'Rourke, James; and Feldberg, Murray, to Multi-Pak Corporation. Waste diverter apparatus for a waste disposal system. 4,070,961, Cl. 100-185.000.
Osan, G. Alan: *See—*
Weisser, Eugene P.; Osan, G. Alan; and Mailki, Edward P., 4,071,816, Cl. 324-30.00B.
Osipovsky, Lev Fedorovich: *See—*
Zubarev, Anatoly Ivanovich; Osipovsky, Lev Fedorovich; and Shipov, Stanislav Valeryanovich, 4,071,093, Cl. 173-105.000.
Oster, Clark L.: *See—*
Cook, James W.; Khalid, Joseph M.; and Oster, Clark L., 4,071,836, Cl. 335-195.000.
Oster Corporation: *See—*
Ernster, Peter Jacob; Collins, William Joseph; and Schaefer, George Henry, 4,071,789, Cl. 310-50.000.
Ostergaard, Neil A. Electro-static fuel mixture system. 4,071,004, Cl. 123-119.00E.
Ostrowski, Jerzy; Sierputowski, Piotr; Turkowski, Lukasz; Jablkiewicz, Jerzy; Pscholski, Jan; and Jedryka, Tadeusz, to Centralny Osrodek Badawczo-Rozwojowy Naszyn Wlokienniczych. Equipment for pneumatic manufacture of yarn. 4,070,812, Cl. 57-58.890.
Otis, Roger W.; and Otis, Stephen H. Floating dry storage facility for small boats. 4,070,979, Cl. 114-263.000.
Otis, Stephen H.: *See—*
Otis, Roger W.; and Otis, Stephen H., 4,070,979, Cl. 114-263.000.
Ouchi, Teruo: *See—*
Kato, Yutaka; Ouchi, Teruo; and Koshiishi, Kiyozo, 4,070,986, Cl. 118-7.000.
Overman, John Arthur: *See—*
Bilczo, Dale Louis; Golonka, Kenneth Anthony; Overman, John Arthur; and Carroll, John Ernest, 4,071,885, Cl. 363-64.000.
Owen, Hartley; and Venuto, Paul B., to Mobil Oil Corporation. Prolonging zeolite catalyst life in methanol conversion to gasoline by disposing of exothermic reaction heat. 4,071,573, Cl. 260-668.00R.
Owens-Corning Fiberglas Corporation: *See—*
Gilbu, Agnar, 4,071,161, Cl. 220-18.000.
Pfeifer, Kenneth D.; and Brooks, Julius C., 4,070,730, Cl. 19-.580.
Roberson, Cletis L., 4,070,731, Cl. 19-159.00R.
Owens, Gerald John, to Bell Telephone Laboratories, Incorporated. Telephone multiline automatic voice answer system. 4,071,888, Cl. 364-200.000.
Owens-Illinois, Inc.: *See—*
Karabedian, James A., 4,071,597, Cl. 264-230.000.
Oy Tampella AB: *See—*
Salmi, Pekka M., 4,070,949, Cl. 91-276.000.
Ozaki, Shoichiro; and Mori, Haruki, to Mitsui Toatsu Chemicals, Incorporated. 1-Carbamoyl-5-fluorouracil derivatives. 4,071,519, Cl. 260-256.40C.
Ozaki, Tsuyoshi: *See—*
Nakagawa, Ryuichi; Yoshimatsu, Shiro; Ueda, Takuya; Fukuzawa, Akira; Ozaki, Tsuyoshi; Sato, Akira; and Mitsui, Tatsuro, 4,071,687, Cl. 13-10.000.
P. R. Mallory & Co. Inc.: *See—*
Dey, Arabinda N., 4,071,664, Cl. 429-194.000.
Scott, Charles E., 4,071,773, Cl. 307-141.000.
Paap, Hans J.: *See—*
Arnold, Dan M.; and Paap, Hans J., 4,071,757, Cl. 250-265.000.
Pace, Incorporated: *See—*
Litt, Kenneth Curtis, 4,070,856, Cl. 60-407.000.
Pacesetter Systems Inc.: *See—*
Schulman, Joseph H., 4,071,032, Cl. 128-419.00P.
Pacholski, Jan: *See—*
Ostrowski, Jerzy; Sierputowski, Piotr; Turkowski, Lukasz; Jablkiewicz, Jerzy; Pacholski, Jan; and Jedryka, Tadeusz, 4,070,812, Cl. 57-58.890.
Pacific Scientific Company: *See—*
Yang, Elmer Chensheng, 4,071,117, Cl. 188-1.00B.
Package Machinery Company: *See—*
Schoppee, Lawrence W., 4,070,851, Cl. 53-228.000.
Packaging Industries, Inc.: *See—*
Bala, John L., 4,070,951, Cl. 93-8.00R.
Padden, William R. Hydronic heating and cooling system. 4,071,078, Cl. 165-27.000.
Paden, Ernest D.; Antolik, James E.; and Boldman, Keith W. Locking means for baling wire. 4,070,734, Cl. 24-28.000.
Pallos, Ferenc M., to Stauffer Chemical Company. Formamidine insecticidal compounds. 4,071,556, Cl. 260-564.0RF.
Palmer, David Nelson; and Heikoff, Stanley, to Combustion Engineering, Inc. Coating material and method. 4,071,639, Cl. 427-156.000.
Pandeya, Arun K., to Data General Corporation. CPU-Synchronous parallel data processor apparatus. 4,071,890, Cl. 364-200.000.
Pantanella, Anthony C. Drawer illuminating device. 4,071,747, Cl. 362-127.000.
Paolinelli, Antonio: *See—*
Piccolo, Luigi; Calcagno, Benedetto; Ghirga, Marcello; and Paolinelli, Antonio, 4,071,347, Cl. 71-31.000.
Pap, Geza: *See—*
Ratcliffe, Charles T.; and Pap, Geza, 4,071,606, Cl. 423-569.000.
Pardee, Robert P., to Ball Brothers Research Corporation. Lubricants comprising dialkanolamine derivatives. 4,071,460, Cl. 252-51.50R.
Paris, Guy: *See—*
Engelhard, Philippe; Weisang, Joseph Edouard; and Paris, Guy, 4,071,437, Cl. 208-137.000.
Parker, Alfred B.: *See—*
Scragg, Robert L.; and Parker, Alfred B., 4,070,861, Cl. 60-641.000.
Parker, Phillip H., to Chevron Research Company. Epoxide thermal stabilization additive for polypyrrolidone. 4,071,486, Cl. 260-18.00N.
Patelhold Patentverwertungs- & Elektro-Holding AG: *See—*
Graf, Alban; and Guanella, Gustav, 4,071,707, Cl. 179-15.55R.
Patterson, John A., to Texaco Inc. Detergent builders and composition containing the same. 4,071,476, Cl. 252-557.000.
Paul, Stewart N., to Chemed Corporation. Precipitation of iron related color bodies. 4,071,450, Cl. 210-53.000.
Payne, Philip Wallace. Underwater voice communicator. 4,071,110, Cl. 181-127.000.
Pearce, Roscoe L., to Dow Chemical Company, The. Selective separation of sulfur oxides from carbon dioxide in an effluent gas stream. 4,071,602, Cl. 423-243.000.
Pearson, Alan; and Hart, Leroy D., to Aluminum Company of America. Production of continuous ceramic fibers. 4,071,594, Cl. 264-63.000.
Pecka, Richard D.; and Templin, Raymond J. Can mounting clip. 4,071,218, Cl. 248-221.400.
Pedersen, John A., to Wheelabrator-Frye Inc. Reinforced finger seal for shot blast cabinets and the like. 4,070,799, Cl. 51-426.000.
Peerless Machine & Tool Corporation: *See—*
Meadors, William R., 4,071,598, Cl. 264-295.000.
Pejcha, Ivan. Apparatus for aligning the head-arm assemblies of a rotary actuated disc drive. 4,071,867, Cl. 360-109.000.
Pelligrino, Paul A.: *See—*
Schneider, Raymond C.; and Pelligrino, Paul A., 4,070,926, Cl. 74-730.000.
Pelser, Eric W. Support structure. 4,071,113, Cl. 182-181.000.
Pepper, William, Jr., to Peptek, Inc. Human-machine interface apparatus. 4,071,691, Cl. 178-19.000.
Pepperman, Armand B., Jr.; Daigle, Donald J.; and Vail, Sidney L., to United States of America, Agriculture. Water soluble adduct of hydroxymethyl phosphorous compound and ammonia or amine compound and method of preparation. 4,071,501, Cl. 260-67.00R.
Pepping, Fraaz: *See—*
Schneppendahl, Richard; Kramer, Heinrich; and Pepping, Franz, 4,071,750, Cl. 362-217.000.
Peptek, Inc.: *See—*
Pepper, William, Jr., 4,071,691, Cl. 178-19.000.
Peradze, Tamaz Vladimirovich; Fridman, Eidlya Abramovna; Zheleznova, Nina Vsevolodovna; Kolikov, Vsevolod Mikhailovich; Bresler, Semen Khaimovich-Efimovich; Mchedlishvili, Boris Viktorovich; Molodkin, Viktor Mikhailovich; Molodkina, Ljudmila Mikhailovna; and Katushkina, Nina Vasilievna. Method of producing vaccines. 4,071,619, Cl. 424-90.000.
Perkins, Charles H., to Robertshaw Controls Company. Solar heat collector system, parts therefor and methods. 4,071,018, Cl. 126-271.000.
Perkins, George C. Radio frequency cautery instrument and control unit therefor. 4,071,028, Cl. 128-303.140.
Pernicano, Vincent S.; and Wright, Michael R., to Art-On Designs, Inc. Packaged shirt with record album stiffener. 4,071,139, Cl. 206-216.000.
Pescarollo, Ermanno: *See—*
Ancillotti, Francesco; Oriani, Gianni; and Pescarollo, Ermanno, 4,071,567, Cl. 260-614.00A.
Peschmann, Kristian, to U.S. Philips Corporation. Electroradiographic device. 4,071,763, Cl. 250-374.000.
Peters, Charles Luther, Jr., to Box Innards, Inc. Structure for locking partitions in open position. 4,071,185, Cl. 229-28.00R.
Peters, Mark A., to Hazen Research, Inc. Process for recovering zinc from steel-making flue dust. 4,071,357, Cl. 75-103.000.
Peters, Michael Noel: *See—*
Clark, William Frederick; Baxendale, Philip Noel; and Peters, Michael Noel, 4,071,364, Cl. 96-36.000.
Peterson, Charles R. Adjustable bed mechanism for a casket. 4,070,737, Cl. 27-12.000.
Peterson, R. Kenneth: *See—*
Dively, Charles R.; and Peterson, R. Kenneth, 4,071,098, Cl. 175-53.000.
Peterson, Robert A. Refuse compactors. 4,070,962, Cl. 100-209.000.
Petrocci, Alfonso N.; Merianos, John J.; and Green, Harold A., to Kewanee Industries. Synergistic antimicrobial mixtures. 4,071,628, Cl. 424-249.000.
Petrolite Corporation: *See—*
Quinlan, Patrick M., 4,071,464, Cl. 252-180.000.
Quinlan, Patrick M., 4,071,746, Cl. 252-392.000.
Petrow, Vladimir: *See—*
Grunwell, Joyce F.; and Petrow, Vladimir, 4,071,624, Cl. 424-238.000.
Grunwell, Joyce F.; and Petrow, Vladimir, 4,071,625, Cl. 424-238.000.
Pettibone Corporation: *See—*
Stone, Milton, 4,071,168, Cl. 222-56.000.
Pevrick Engineering Company, Inc.: *See—*
Hedrick, John R., 4,071,030, Cl. 128-310.000.
Pfeifer, Kenneth D.; and Brooks, Julius C., to Owens-Corning Fiberglas Corporation. Production of chopped fibers. 4,070,730, Cl. 19-.580.
Pfeiffer, G. William, to Minnesota Mining and Manufacturing Company. Stethoscope. 4,071,694, Cl. 179-1.0ST.
Pfeuti, Ulrich: *See—*
Aenishaenslin, Werner; Suter, Fritz; Pfeuti, Ulrich; and Haag, Paul, 4,070,965, Cl. 101-228.000.
Phillips, Charles M., Jr. Interrupter. 4,071,872, Cl. 361-56.000.

Phillips, Paul Millard; and Donaldson, John Gleason, to GTE Sylvania Incorporated. Glass for metal seal. 4,071,658, Cl. 428-555.000.

Phillips Petroleum Company: *See—*
Banks, Robert L.; and Kenton, Joseph R., 4,071,471, Cl. 252-437.000.
Edmonds, James T., Jr., 4,071,509, Cl. 260-79.000.
Gifford, Phillip H., II, 4,071,434, Cl. 208-11.0LE.
Hanson, Donald O., 4,071,433, Cl. 208-11.0LE.
Johnson, Marvin M.; and Nowack, Gerhard P., 4,071,331, Cl. 48-197.00R.
Kraus, Gerard; and Hunt, Harold R., 4,071,496, Cl. 260-42.360.
Meister, John J., 4,071,457, Cl. 252-8.55D.
Richards, Frank P.; and Taylor, Raymond C., 4,070,953, Cl. 93-39.10R.
Roof, Lewis B., 4,070,913, Cl. 73-422.0GC.
Uraneck, Carl A.; Burleigh, John E.; and Solomon, Paul W., 4,071,679, Cl. 526-338.000.

Phipps, Jack R.: *See—*
Thuren, John B.; Datwyler, Walter F., Jr.; and Phipps, Jack R., 4,071,013, Cl. 123-32.0SP.

Physical Systems, Inc.: *See—*
Hutter, Charles G., III; and Hutter, Peter S., 4,071,338, Cl. 55-385.00C.

Piasecki Aircraft Corporation: *See—*
Piasecki, Frank N.; and Meyers, Donald N., 4,071,207, Cl. 244-23.00D.

Piasecki, Frank N.; and Meyers, Donald N., to Piasecki Aircraft Corporation. Vertical take-off aircraft. 4,071,207, Cl. 244-23.00D.

Piccolo, Luigi; Calcagno, Benedetto; Ghirga, Marcello; and Paolinelli, Antonio, to Societa' Italiana Resine S.I.R. S.p.A. Novel composition for use in agriculture as soil improvers and fertilizers and process for their production. 4,071,347, Cl. 71-31.000.

Picker Corporation: *See—*
Brunnett, Carl J.; Cox, Jerome R., Jr.; Snyder, Donald L.; and Mattson, Rodney A., 4,071,769, Cl. 250-445.00T.

Pickles, Sidney, to E-Systems, Inc. Radio navigation antenna system. 4,071,847, Cl. 343-761.000.

Pilette, Yvan P.: *See—*
Collier, John R.; and Pilette, Yvan P., 4,071,367, Cl. 96-79.000.

Pilkington Brothers Limited: *See—*
Duncan, Angus Dougal, 4,070,936, Cl. 83-12.000.

Pinch, Harry Louis; Abeles, Benjamin; and Gittleman, Jonathan Isaac, to RCA Corporation. Method of making high resistance cermet film. 4,071,426, Cl. 204-192.00F.

Pishioneri, Philip J. Holder for welding electrode. 4,071,733, Cl. 219-141.000.

Pitney-Bowes, Inc.: *See—*
Brana, George; and Vijayendran, Bheema Rao, 4,071,655, Cl. 428-403.000.
Macari, Leonard J.; and Canevari, Louis T., 4,071,104, Cl. 177-229.000.

Pitt, Harold M., to Stauffer Chemical Company. Use of free radical initiators in thiolcarbamate preparation. 4,071,423, Cl. 204-158.00R.

Plastomedical Sciences, Inc.: *See—*
Steckler, Robert, 4,071,508, Cl. 260-79.3MU.

Platz, Gerald M.; and Walkup, Norris W., to National Distillers and Chemical Corporation. Ethylene polymerization reactor. 4,071,325, Cl. 23-290.000.

Plegat, Alain Edouard, to Societe Anonyme des Usines Chausson. Apparatus for brazing end plates and the like. 4,071,181, Cl. 228-43.000.

Plueddemann, Edwin P., to Dow Corning Corporation. Silicon-containing chelating composition and method therefor. 4,071,546, Cl. 260-448.20N.

Poggemeier, Erich: *See—*
Dittrich, Wolfhart; Heuer, Helmut; Kamm, W. F. G.; Kipp, Thorwald; Luhr, Gerhard; and Poggemeier, Erich, 4,071,637, Cl. 427-12.000.

Polak, James C., to General Motors Corporation. Planetary gearing arrangement for a transmission. 4,070,927, Cl. 74-765.000.

Polaroid Corporation: *See—*
Bourgeois, Gerard J.; and Sahatjian, Ronald A., 4,071,366, Cl. 96-73.000.
Johnson, Bruce K., 4,071,851, Cl. 354-354.000.
Scibilia, Peter A., 4,071,294, Cl. 352-72.000.

Pollock, Eugene J. Loop integration control system. 4,071,744, Cl. 364-105.000.

Pommer, Ernst-Heinrich: *See—*
Rentzea, Costin; Zeeh, Bernd; Koenig, Karl-Heinz; and Pommer, Ernst-Heinrich, 4,071,685, Cl. 548-312.000.

Porro, Luigi. Apparatus for making chips of thermoplastic material. 4,071,307, Cl. 425-72.00R.

Portnoy, Seymour: *See—*
Gisser, Henry; and Portnoy, Seymour, 4,071,678, Cl. 526-328.000.

Post Machinery Company, Inc.: *See—*
Diluiso, Arthur A.; and Post Machinery Company, Inc., 4,070,960, Cl. 100-49.000.

Potomac Applied Mechanics, Inc.: *See—*
Stubbings, James Henry, 4,070,890, Cl. 72-129.000.

Pott, James T.: *See—*
Kinkead, Jordan A.; Pott, James T.; Sherman, Roger M.; and Sullivan, Eugene F., 4,071,152, Cl. 214-75.00R.

Potthoff, Robert Edward: *See—*
Russell, John L., Jr.; and Potthoff, Robert Edward, 4,071,017, Cl. 126-271.000.

PPG Industries, Inc.: *See—*
Bohy, August G.; and Barch, Herbert W., 4,071,341, Cl. 65-11.00W.
Bosso, Joseph F.; and Wismer, Marco, 4,071,428, Cl. 204-181.00C.
Griffiths, David H., 4,071,339, Cl. 65-3.00R.
Melle, Carl A., 4,071,340, Cl. 65-11.00R.
Schaefer, William L.; and Briar, Thomas J., 4,071,342, Cl. 65-11.00R.

Pratt, George Christopher; Eastwood, Barry John; Michael, Anthony Dennis; and Heath, Leonard, to Glacier Metal Company Limited, The. Method of manufacturing bearing material. 4,071,643, Cl. 427-292.000.

Prazak, Karel: *See—*
Vasek, Vitezslav; Koblizek, Pavel; and Prazak, Karel, 4,071,052, Cl. 139-436.000.

Precision Dynamics Corporation: *See—*
Schimmelman, Arthur H., 4,070,745, Cl. 29-268.000.

Pressure Science Incorporated: *See—*
Halling, Horace P.; and Sadoff, Bernard J., Jr., 4,071,268, Cl. 285-95.000.
Halling, Horace P.; and Sadoff, Bernard J., Jr., 4,071,269, Cl. 285-165.000.

Price, Donald L. Electrical power supply method and system for open pit mining equipment. 4,071,124, Cl. 191-12.00R.

Price, James B.: *See—*
Estreicher, Isabelle E.; and Price, James B., 4,071,397, Cl. 156-662.000.

Pritchard, Roger D. Corner gussett. 4,071,301, Cl. 403-231.000.

Produits Chimiques Ugine Kuhlmann: *See—*
Strassel, Albert, 4,071,390, Cl. 156-239.000.

Proper, David Staples: *See—*
Feierabend, Louis Bock; and Proper, David Staples, 4,071,869, Cl. 360-135.000.

Prough, James R., to Kamyr, Inc. Apparatus and method for the displacement impregnation of cellulosic chips material. 4,071,399, Cl. 162-16.000.

Prugnaud, Robert Louis, to Laboratoire Theranol. Processes, reagents and means for early diagnosis of pregnancy. 4,071,314, Cl. 23-230.00B.

Pugliese, Peter, to Xienta, Inc. Apparatus and methods for performing in-vivo measurements of enzyme activity. 4,071,020, Cl. 128-2.00A.

Pugsley, Thomas A.: *See—*
Ferland, Jean-Marie; Laliberte, Real; Lippmann, Wilbur; and Pugsley, Thomas A., 4,071,552, Cl. 260-501.170.

Purdue Research Foundation: *See—*
Ash, Stephen R.; Wilcox, Philip G.; and Kessler, David P., 4,071,444, Cl. 210-22.00A.

Pury, Thomas; Konle, Robert L.; and Sivertsen, Marvin L., to General Electric Company. Palpator for x-ray spot film device. 4,071,767, Cl. 250-444.000.

Pyatt, Theodore Wayne: *See—*
Dalton, Thomas B.; Pyatt, Theodore Wayne; and Oosterhouse, Michael Jay, 4,071,274, Cl. 296-35.00A.

Pyramid Enterprises, Inc.: *See—*
Davis, Dalton M., 4,071,280, Cl. 301-65.000.

Quandt, Gerhard; Ries, Werner; and Richter, Joachim, to Teldix G.m.b.H. Open end spinning unit having reduced operating power requirements. 4,070,813, Cl. 57-58.890.

Queen's University at Kingston: *See—*
Wolfe, Saul, 4,071,512, Cl. 260-239.00A.

Quigley, William A.: *See—*
Lynch, Jerome G.; and Quigley, William A., 4,071,688, Cl. 174-138.00R.

Quinlan, Patrick M., to Petrolite Corporation. Uses of methylene phosphonates of poly-diepoxidized polyalkylene polyamines. 4,071,464, Cl. 252-180.000.

Quinlan, Patrick M., to Petrolite Corporation. Alkylbenzyl pyridinium compounds and uses. 4,071,746, Cl. 252-392.000.

Quis, Peter: *See—*
Boessler, Hanns; Quis, Peter; Buechse, Joachim; and Rauch, Hubert, 4,071,653, Cl. 428-332.000.

Qureshi, Faiz Mohammad. Slide rule cursor. 4,071,189, Cl. 235-70.00B.

R. Alkan & Cie.: *See—*
Bourrie, Georges E.; and Lensel, Robert Marc, 4,071,271, Cl. 292-201.000.

Radecki, Tony: *See—*
Gunzel, Rudolph M., Jr.; and Radecki, Tony, 4,071,170, Cl. 222-193.000.

Rademachers, Jakob, to Bayer Aktiengesellschaft. Hardener for production solid foams or compact structure from aqueous solutions. 4,071,480, Cl. 260-2.50F.

Raimondi, Albert A.; Kaufman, Howard N.; and Wood, Norman J., to Westinghouse Electric Corporation. Static sealing mechanism for a compressor. 4,071,254, Cl. 277-3.000.

Rakar, Geza: *See—*
Fulop, Miklos; and Rakar, Geza, 4,071,097, Cl. 175-56.000.

Ramirez, Ernest R., to Swift & Company. Dewatering of wastewater treatment wastes. 4,071,447, Cl. 210-44.000.

Randall, Hubert E. Reversible outboard motor with exhaust gas discharge control. 4,070,983, Cl. 115-17.000.

Randen, Neil A.: *See—*
Grimm, Robert A.; Randen, Neil A.; and Demas, Christopher L., 4,071,554, Cl. 260-558.00H.

Rank Organisation Limited, The: *See—*
Siddall, Graham John, 4,070,762, Cl. 33-174.00Q.

Ranzanigo, Pierluigi, to Bassani Ticino S.p.A. Fuse cartridge. 4,071,837, Cl. 337-268.000.

Raspet, Jernej; and Zagar, Marjan, to Slovenske zelezarne Tovarna Verig s.p.o. Snow chain for tires of motor vehicles for quick mounting. 4,071,069, Cl. 152-213.00A.
Ratcliffe, Charles T.; and Pap, Geza, to Allied Chemical Corporation. Sulfur dioxide with coal. 4,071,606, Cl. 423-569.000.
Rattner, Richard G. Package and display device. 4,071,140, Cl. 206-295.000.
Rau, Fritz: *See*—
Ermel, Heinrich; Fruth, Franz; Fryda, Georg; Lang, Peter; Rau, Fritz; and Vossnacke, Jurgen, 4,071,296, Cl. 355-15.000.
Rauch, Hubert: *See*—
Boessler, Hanns; Quis, Peter; Buechse, Joachim; and Rauch, Hubert, 4,071,653, Cl. 428-332.000.
Rault, Daniel Raymond, to Societe Lorraine de Laminage Continu. Metal sheet for drawing. 4,071,657, Cl. 428-646.000.
Raychem Corporation: *See*—
Evans, Joseph H.; and Wolfe, Richard B., 4,070,746, Cl. 29-450.000.
Raymond Lee Organization: *See*—
Seager, Reuben, 4,071,219, Cl. 248-534.000.
Raymond Lee Organization, Inc., The: *See*—
Gallacci, Joe, 4,071,021, Cl. 128-52.000.
Yakiwchuk, John, 4,070,771, Cl. 37-53.000.
Raytheon Company: *See*—
Gross, Fritz A., 4,071,845, Cl. 343-113.00R.
Legat, Wilhelm H.; Taft, Keith G.; and Tiefert, Karl H., 4,070,748, Cl. 29-577.00C.
RCA Corporation: *See*—
Herrmann, Eric Peter, 4,071,777, Cl. 307-229.000.
Isham, Robert Haynes, II, 4,071,776, Cl. 307-228.000.
Kannam, Peter Joseph, 4,071,852, Cl. 357-13.000.
Kongelka, Robert Michael, 4,071,217, Cl. 248-309.00R.
McGuffin, William George, 4,071,825, Cl. 325-38.00B.
Muhlfelder, Ludwig; Keigler, John Edward; and Stewart, Brian, 4,071,211, Cl. 244-165.000.
Pinch, Harry Louis; Abeles, Benjamin; and Gittleman, Jonathan Isaac, 4,071,426, Cl. 204-192.00F.
Warren, Charles Stewart, 4,071,706, Cl. 179-15.0AL.
RCA Limited: *See*—
Waksberg, Armand, 4,071,751, Cl. 250-201.000.
Red Wing Shoe Company, Inc.: *See*—
Vello, Francesco, 4,070,770, Cl. 36-43.000.
Redden, Robert F.: *See*—
Charlton, Thomas L.; Redden, Robert F.; Hirsch, Horst E.; and Liang, Shou C., 4,071,422, Cl. 204-105.00R.
Redo, Dennis M.: *See*—
Thompson, Walter F.; and Redo, Dennis M., 4,071,150, Cl. 214-16.40R.
Redzi, Jan: *See*—
Ciborowski, Stanislaw; Szczypinski, Zbigniew; Balcerzak, Kazimierz; Jaworski, Andrzej; Kasznia, Andrzej; Krzysztoforski, Andrzej; Kurowski, Stanislaw; Redzi, Jan; and Szparski, Jozef, 4,071,561, Cl. 260-586.00P.
Regie Nationale des Usines Renault: *See*—
Barres, Roland, 4,070,828, Cl. 60-274.000.
Lombard, Claude Edmond; and Bouvet, Jean-Marie, 4,071,042, Cl. 137-332.000.
Rehder, Robert Henry, to Canadian General Electric Co., Ltd. Structure for electrical interface. 4,071,882, Cl. 361-333.000.
Reid, Luther James. Chemical reactor. 4,071,324, Cl. 23-288.00K.
Reidy, Robert A. Holder for paint cans and the like. 4,071,214, Cl. 248-211.000.
Reinhardt, Jack; Moehle, Kenneth Albert; and Hinke, Jerald Dietrich. Hydraulic clutch-controlled transmission gear detent system. 4,070,914, Cl. 74-475.000.
Rellensmann, Wolfgang: *See*—
Bueb, Michael; Kubitzek, Harry; Langhans, Arthur; Rellensmann, Wolfgang; and Wagner, Wolfram, 4,070,817, Cl. 57-157.0TS.
Rentzea, Costin; Zeeh, Bernd; Koenig, Karl-Heinz; and Pommer, Ernst-Heinrich, to BASF Aktiengesellschaft. 1-Alkylcarbamoyl-3-(3,5-dichlorophenyl)-hydantoins. 4,071,685, Cl. 548-312.000.
Reppas, George S. Combination bed and desk. 4,070,715, Cl. 5-2.00R.
Research Corporation: *See*—
Flashner, Michael; and Tanenbaum, Stuart W., 4,071,408, Cl. 195-62.000.
Research Foundation for Microbial Diseases of Osaka University: *See*—
Konobe, Takeo; Onoda, Tetsuo; and Ono, Koichi, 4,071,618, Cl. 424-89.000.
Retzlaff, Reynold R. Bracket connection for backhoe and skip loader. 4,071,154, Cl. 214-145.00A.
Reuschling, Dieter-Bernd: *See*—
Kuhlein, Klaus; Reuschling, Dieter-Bernd; Babej, Milos; Bartmann, Wilhelm; and Beck, Gerhard, 4,071,530, Cl. 260-326.450.
Reutter, Siegfried: *See*—
Bubik, Alfred; Reutter, Siegfried; Schultz, Hans-Joachim; and Stotz, Wolf-Gunter, 4,071,401, Cl. 162-300.000.
Reverend, Roger; and Cochin, Yves, to Safama. Device intended for the hooking of panels on a wall in order to constitute a covering on this wall. 4,070,835, Cl. 52-235.000.
Rhodes, Earl H., Jr.: *See*—
Richmond, James W.; and Rhodes, Earl H., Jr., 4,071,029, Cl. 128-305.000.
Rhone-Poulenc Industries: *See*—
Berger, Christian; Farge, Daniel; Gros, Georges; Messer, Mayer Naoum; and Moutonnier, Claude, 4,071,531, Cl. 260-327.00P.
Ribbecke, Lawrence F.; and Shu, Chi Chen, to Sapolin Paints, Inc. Water dispersible alkyd paint composition. 4,071,514, Cl. 260-22M.
Richan, Max R. Ore separating method and apparatus. 4,071,143, Cl. 209-444.000.
Richard, Pierre D.; and Tessier, Claude R., to Societe des Telephones Picart Lebas. Push-button switch for a multifrequency dialling telephone set. 4,071,715, Cl. 179-90.00K.
Richards, Frank P.; and Taylor, Raymond C., to Phillips Petroleum Company. Method for producing a container. 4,070,953, Cl. 93-39.10R.
Richards, Marvin David. Suspension game. 4,071,244, Cl. 273-275.000.
Richardson-Merrell Inc.: *See*—
Grunwell, Joyce F.; and Petrow, Vladimir, 4,071,624, Cl. 424-238.000.
Grunwell, Joyce F.; and Petrow, Vladimir, 4,071,625, Cl. 424-238.000.
Richcreek, Harry G. Prawn trap. 4,070,788, Cl. 43-100.000.
Richey, John M.: *See*—
Stenger, Richard E.; Ekstedt, Edward E.; Richey, John M.; and Seto, Stanford P., 4,070,826, Cl. 60-39.660.
Richmond, James W.; and Rhodes, Earl H., Jr., to Stryker Corporation. Angle handpiece. 4,071,029, Cl. 128-305.000.
Richter Gedeon Vegyeszeti Gyar Rt.: *See*—
Tuba, Zoltan; Marsai, Maria; Biro, Katalin; Szporny, Laszlo; Karpati, Egon; and Szeberenyi, Szabolcs, 4,071,515, Cl. 260-239.500.
Richter, Joachim: *See*—
Quandt, Gerhard; Ries, Werner; and Richter, Joachim, 4,070,813, Cl. 57-58.890.
Ricoh Company, Ltd.: *See*—
Fujimoto, Sakae, 4,071,232, Cl. 271-8.00R.
Ries, Werner: *See*—
Quandt, Gerhard; Ries, Werner; and Richter, Joachim, 4,070,813, Cl. 57-58.890.
Riker Laboratories, Inc.: *See*—
Banitt, Elden H., 4,071,524, Cl. 260-293.770.
Rinker, Steven Allen: *See*—
Jovic, Nicola Ljotic; and Rinker, Steven Allen, 4,071,699, Cl. 179-5.500.
Riopelle, Joseph A., to Midland-Ross Corporation. Method for case hardening powdered metal parts. 4,071,382, Cl. 148-126.000.
Risher, Francis E. Tool sharpening apparatus. 4,070,929, Cl. 76-82.000.
Roberson, Cletis L., to Owens-Corning Fiberglas Corporation. Method of and apparatus for packaging a linear fibrous element. 4,070,731, Cl. 19-159.00R.
Robert Bosch GmbH: *See*—
Bassler, Gerd, 4,071,730, Cl. 219-85.0CM.
Kalippke, Harald; Gerber, Richard; and Ehrmann, Karl, 4,071,792, Cl. 310-70.00R.
Robert Krups, Firma: *See*—
Lorenz, Horst, 4,070,941, Cl. 83-478.000.
Roberts, David William: *See*—
McGee, Thomas; and Roberts, David William, 4,071,456, Cl. 252-8.700.
Roberts, James L.: *See*—
Harthill, William P.; and Roberts, James L., 4,071,821, Cl. 324-83.00R.
Roberts, Jefery R.: *See*—
Barger, Franklin V., Jr.; Knox, Richard M.; and Roberts, Jefery R., 4,071,698, Cl. 179-2.00R.
Robertshaw Controls Company: *See*—
Perkins, Charles H., 4,071,018, Cl. 126-271.000.
Robinson, Dale D. Failsafe fluid control valve. 4,071,038, Cl. 137-59.000.
Robinson, James H., to CTS Corporation. Method of making an electrical switch and chemically milled contacts. 4,070,752, Cl. 29-630.00B.
Robinson, Richard L.; and Volgyesy, Ivan L., to Indian Head Inc. Electrical junction and switch boxes. 4,071,159, Cl. 220-3.200.
Robinson, Ronald R.: *See*—
Bailey, John M.; and Robinson, Ronald R., 4,071,197, Cl. 239-533.110.
Robinson, Victor S., to New Jersey Zinc Company, The. Method for preparing particulate zinc oxide shapes of high surface area and improved strength. 4,071,609, Cl. 423-622.000.
Rockwell International Corporation: *See*—
Brown, James L., 4,071,901, Cl. 364-605.000.
Huffman, Charles E.; McGuire, Robert J.; and Waddill, John W., 4,071,700, Cl. 179-15.0BF.
Schuldt, Theodore J., 4,071,894, Cl. 364-430.000.
Rod, Robert L.: *See*—
Bishton, Norris J., Jr.; Rod, Robert L.; Wagenhals, Bruce; Woltanski, Theodore M.; and Blick, John S., III, 4,070,714, Cl. 4-318.000.
Rodney Hunt Company: *See*—
Brown, David C., 4,070,863, Cl. 61-28.000.
Rogers, Walter Clark, Jr., to Royal Development Company, Inc. Recliner chair with wall avoiding action. 4,071,275, Cl. 297-85.000.
Rohlinger, Daniel P. Level and collapsible ruler. 4,070,764, Cl. 33-342.000.
Rohm GmbH: *See*—
Boessler, Hanns; Quis, Peter; Buechse, Joachim; and Rauch, Hubert, 4,071,653, Cl. 428-332.000.
Rohm and Haas Company: *See*—
Emmons, William D.; Nyi, Kayson; and Sperry, Peter R., 4,071,489, Cl. 260-22.0CB.
Kunin, Robert, 4,071,446, Cl. 210-32.000.
Rohosy, Soma M.: *See*—
Schreyer, Kenneth D.; and Rohosy, Soma M., 4,070,823, Cl. 59-93.000.
Rohr, Willy: *See*—
Haltmeier, Paul; Freisler, Erhard; and Rohr, Willy, 4,071,055, Cl. 139-448.000.

Roman, Walter G.: *See*—
Andrews, Harry N.; and Roman, Walter G., 4,071,403, Cl. 176-50.000.
Roof, Lewis B., to Phillips Petroleum Company. Sample dilution. 4,070,913, Cl. 73-422.0GC.
Rose, Peter, to Heidenreich & Harbeck Zweigniederlassung der Gildemeister AG. Method for manufacturing plastics blanks. 4,071,532, Cl. 264-328.000.
Rosenberg, Harry W. Multiple picture frame. 4,070,780, Cl. 40-152.000.
Rosenberger, Michael: *See*—
Cohen, Noal; Rosenberger, Michael; and Saucy, Gabriel, 4,071,537, Cl. 260-345.90S.
Rostek, Manfred: *See*—
Schwuger, Milan Johann; Smolka, Heinz; Altenschopfer, Theodor; and Rostek, Manfred, 4,071,377, Cl. 134-29.000.
Roth, Leo; and Roth, Ursula. Micrometer. 4,070,760, Cl. 33-166.000.
Roth, Mario: *See*—
Werner, Alfons; Roth, Mario; Siemonsen, Hans-Peter; and Winandi, Johann, 4,071,345, Cl. 65-273.000.
Roth, Ursula: *See*—
Roth, Leo; and Roth, Ursula, 4,070,760, Cl. 33-166.000.
Rouban, Basile, to Trayvou S.A. Auxiliary dynamic compensation devices for gravimetric dispensers. 4,071,103, Cl. 177-188.000.
Roulund, Poul B., to Xerox Corporation. Beam alignment detector. 4,071,754, Cl. 250-227.000.
Roumailhac, Jean: *See*—
Guidez, Joel; Lecouvreur, Paul; and Roumailhac, Jean, 4,071,303, Cl. 415-112.000.
Rovnyak, Richard Michael: *See*—
Lee, David Quon; and Rovnyak, Richard Michael, 4,071,709, Cl. 179-18.0HB.
Royal Development Company, Inc.: *See*—
Cecil, Nelson Lothair, 4,071,276, Cl. 297-85.000.
Rogers, Walter Clark, Jr., 4,071,275, Cl. 297-85.000.
Rozhkov, Leonid Georgievich: *See*—
Tkach, Khaim Berkovich; Kostylev, Alexandr Dmitrievich; Tupitsyn, Konstantin Konstantinovich; Gurkov, Konstantin Stepanovich; Klimashko, Vladimir Vasilievich; Rozhkov, Leonid Georgievich; Bondar, Mikhail Jurievich; and Smolyanitsky, Boris Nikolaevich, 4,070,948, Cl. 91-234.000.
Ruda, Raymond J., to Bagcraft Corporation of America. Self-closing bag. 4,071,186, Cl. 229-62.000.
Rudmark, Hans: *See*—
Kurz, Fredrik Wilhelm; and Rudmark, Hans, 4,071,369, Cl. 106-40.00R.
Rudolph, Frank W.: *See*—
Mead, Ralph T.; Greatbatch, Wilson; and Rudolph, Frank W., 4,071,662, Cl. 429-178.000.
Ruehr, William C.: *See*—
Vanfleet, Charles R.; and Ruehr, William C., 4,070,827, Cl. 60-204.000.
Ruiz, Roberto. Lock shielding assembly. 4,070,882, Cl. 70-427.000.
Rupert, Gerald B.; and Tyler, Lawson John, to United States of America, Interior. Modified roof strain indicator. 4,070,906, Cl. 73-88.00E.
Russell, Frank B., to Swift & Company. Non-releasable hand grip for package or loop handle of a bag. 4,071,063, Cl. 150-12.000.
Russell, John L., Jr.; and Potthoff, Robert Edward, to General Atomic Company. Tensioned reflector support system. 4,071,017, Cl. 126-271.000.
Russell, Richard, to U.S. Blind Stitch Machine Corporation. Ruffler attachment for sewing machine. 4,070,975, Cl. 112-135.000.
Russo, Roland; and Schneider, Richard, to Clark Control, Inc. Relay contact carrier coated with an antistatic material. 4,071,835, Cl. 335-133.000.
Ruti Machinery Works Ltd.: *See*—
Haltmeier, Paul; Freisler, Erhard; and Rohr, Willy, 4,071,055, Cl. 139-448.000.
Strauss, Edgar, 4,071,051, Cl. 139-436.000.
Rutt, Truman C., to N L Industries, Inc. Ceramic bodies with end termination electrodes. 4,071,880, Cl. 361-309.000.
Rutz, Leon E., to Houdaille Industries, Inc. Hydraulic drive circuit for machine tools. 4,070,831, Cl. 60-371.000.
Rybka, Bruno: *See*—
Andrascheck, Hans-Joachim; Mucke, Rainer; Lorz, Werner; Borchard, Heinz; Buck, Jurgen; Knothe, Herbert; and Rybka, Bruno, 4,071,490, Cl. 260-23.0XA.
S.A.E.S. Getters S.p.A.: *See*—
Barosi, Aldo, 4,071,335, Cl. 55-68.000.
S. C. Johnson & Son, Inc.: *See*—
Bloch, Daniel Richard, 4,071,616, Cl. 424-76.000.
Saam, John C.: *See*—
Falender, James R.; Mettler, Claudia M.; and Saam, John C., 4,071,577, Cl. 260-827.000.
Sadoff, Bernard J., Jr.: *See*—
Halling, Horace P.; and Sadoff, Bernard J., Jr., 4,071,268, Cl. 285-95.000.
Halling, Horace P.; and Sadoff, Bernard J., Jr., 4,071,269, Cl. 285-165.000.
Safama: *See*—
Reverend, Roger; and Cochin, Yves, 4,070,835, Cl. 52-235.000.
Saggese, Michael Frank: *See*—
Leggiere, Robert; and Saggese, Michael Frank, 4,070,843, Cl. 52-521.000.
Sahatjian, Ronald A.: *See*—
Bourgeois, Gerard J.; and Sahatjian, Ronald A., 4,071,366, Cl. 96-73.000.
Saint-Gobain Industries: *See*—
Hanton, Daniel, 4,071,481, Cl. 260-2.50F.
Sauer, Gerd, 4,070,781, Cl. 40-219.000.
Schmidt, Gunther, 4,071,346, Cl. 65-351.000.
Werner, Alfons; Roth, Mario; Siemonsen, Hans-Peter; and Winandi, Johann, 4,071,345, Cl. 65-273.000.
Saito, Yoshihisa: *See*—
Kamiya, Takashi; Teraji, Tsutomu Toyonaka; Hashimoto, Masashi; Oku, Teruo Kyoto; Nakaguti, Osamu; Saito, Yoshihisa; and Nakamura, Hitoshi, 4,071,527, Cl. 260-306.500.
Sakaguchi, Yasuhiro: *See*—
Katayama, Sakae; Kanada, Sadaoki; Kamata, Michitake; Sakaguchi, Yasuhiro; and Kojima, Katsumi, 4,071,445, Cl. 210-23.00H.
Sakaki, Yoshihiro, to Nissan Motor Co., Ltd. Sealing member for a rotary heat-accumulator type heat exchanger for a gas turbine engine. 4,071,076, Cl. 165-9.000.
Sakamaki, Hisashi: *See*—
Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, 4,071,295, Cl. 355-3.0SH.
Salmi, Pekka M., to Oy Tampella AB. Hydraulic striking apparatus. 4,070,949, Cl. 91-276.000.
Salter, Lowell S., Jr., to Morgan Construction Company. Flexible seal element with reinforced drain labyrinth. 4,071,255, Cl. 277-57.000.
Sami, Yasuo, to Sanyo Electric Co., Ltd. Tape cartridge positioning and ejection device. 4,071,859, Cl. 360-96.000.
Sander, Willy M.: *See*—
Whitney, James C.; Sander, Willy M.; and Debaudringhien, Andre T., 4,071,857, Cl. 360-92.000.
Sanders Associates, Inc.: *See*—
Holl¹s, Ernest E., 4,070,769, Cl. 35-10.400.
Sanders, Duane, to Thermoguard Insulation Company. Open top plastic bag sealer. 4,070,853, Cl. 53-373.000.
Sandoz, Inc.: *See*—
Mattner, Paul G.; and Smith, Joseph A., 4,071,557, Cl. 260-570.0AB.
Schwarz, Hans J., 4,071,516, Cl. 260-251.0QB.
Sandoz Ltd.: *See*—
Wiskott, Erik; and Troxler, Franz, 4,071,630, Cl. 424-256.000.
Sandvik, Roger H.; and Huebscher, Richard G., to Design & Manufacturing Corporation. Fluid actuator. 4,070,946, Cl. 91-25.000.
Sankyo Company Limited: *See*—
Yanagisawa, Hiroaki; Ando, Akiko; Fukushima, Masami; and Nakao, Hideo, 4,071,681, Cl. 542-420.000.
Santala, Teuvo J., to Texas Instruments Incorporated. Solar absorption surface panel. 4,071,659, Cl. 428-677.000.
Santucci, Nicola; Aleksandrovic, Zabotin Aleksandr; Dmitrievich, Loschilin Evghenii; Lvovich, Galperin Aleksandr; and Archakovich, Onikov Eduard, to Nuovo Pignone S.p.A. Device for the formation of the shed in a multished loom. 4,071,053, Cl. 139-436.000.
Santucci, Nicola; Aleksandrovic, Zabotin Aleksandr; Dmitrievich, Loschilin Evghenii; Lvovich, Galperin Aleksandr; Archakovich, Onikov Eduard; Aleksandrovich, Sakharov Boris; and Alekseevich, Borodin Valerian, to Nuovo Pignone S.p.A.; and ANIKHBI: Tsentralny Nauchne-isaledevatelsky institut khlopehatobumiezhnoi promyshlinnesti. Device for displacing the weft-carriers in a multished loom. 4,071,054, Cl. 139-436.000.
Sanyo Electric Co., Ltd.: *See*—
Sami, Yasuo, 4,071,859, Cl. 360-96.000.
Sapolin Paints, Inc.: *See*—
Ribbecke, Lawrence F.; and Shu, Chi Chen, 4,071,514. Cl. 260-22M.
Satake, Keigo: *See*—
Aoki, Katsumichi; Shimizu, Susumu; Satake, Keigo; Yamazaki, Shiro; and Hatakeyama, Nobuo, 4,071,633, Cl. 424-324.000.
Sato, Akira: *See*—
Nakagawa, Ryuichi; Yoshimatsu, Shiro; Ueda, Takuya; Fukuzawa, Akira; Ozaki, Tsuyoshi; Sato, Akira; and Mitsui, Tatsuro, 4,071,687, Cl. 13-10.000.
Sato, Fumiyuki: *See*—
Takanashi, Yukio; Sato, Fumiyuki; and Shinpo, Masanori, 4,071,803, Cl. 313-409.000.
Sato, Kuniaki, to Kajima Corporation. Hollow steel column base member and welding thereof. 4,070,837, Cl. 52-297.000.
Satoh, Tsuyoshi, to Mitsubishi Denki Kabushiki Kaisha. Signal transmission system. 4,071,714, Cl. 179-82.000.
Satt, Henry; and Neuberg, Dave. Foldable playpen. 4,070,716, Cl. 5-99.00C.
Sattelmeyer, Richard: *See*—
Werner, Gerhard; Grafe, Peter; Sattelmeyer, Richard; and Schmelzer, Heinz, 4,071,676, Cl. 526-283.000.
Saucy, Gabriel: *See*—
Cohen, Noal; Rosenberger, Michael; and Saucy, Gabriel, 4,071,537, Cl. 260-345.90S.
Sauer, Gerd, to Saint-Gobain Industries. Windows bearing an inscription. 4,070,781, Cl. 40-219.000.
Saul, Franz J. Packing container or receptacle. 4,071,064, Cl. 150-48.000.
Savran, Vasily Grigorievich: *See*—
Zarechensky, Anatoly Vasilievich; Kolechko, Alexei Afanasievich; Manov, Vladimir Mikhailovich; Korjukova, Alla Grigorievna; Savran, Vasily Grigorievich; and Serenko, Alexandr Nikitich, 4,071,734, Cl. 219-146.310.
Sawachika, Yasumasa; and Kawakami, Hiroshi, to Kohkoku Chemical Industry Co., Ltd. Process for preparing flexible flame retarding polyurethane foams. 4,071,484, Cl. 260-2.5AT.
Scamaton, William Bertram, to Secretary of State for Industry in Her Britannic Majesty's Government of the United Kingdom of Great

Britain & Northern Ireland, The. Electro-explosive igniters. 4,070,970, Cl. 102-28 00R.
Schaefer, George Henry: *See*—
Ernster, Peter Jacob; Collins, William Joseph; and Schaefer, George Henry, 4,071,789, Cl. 310-50.000.
Schaefer, Klaus Dieter: *See*—
Leitz, Ludwig; Heitmann, Knut; Schneider, Eckart; and Schaefer, Klaus Dieter, 4,071,297, Cl. 356-4.000.
Schaefer, William L.; and Briar, Thomas J., to PPG Industries, Inc. Apparatus for forming glass fibers. 4,071,342, Cl. 65-11.00R.
Schaeffer, Merle J., to National Geographic Society. Underwater camera casing. 4,071,066, Cl. 150-52.00J.
Schaffter, Craig, to TRW, Inc. Time slot interchanger. 4,071,703, Cl. 179-15.0AQ.
Schauer, Siegfried, to Gebr. Pfeiffer AG. Bypass separator. 4,071,441, Cl. 209-144.000.
Scheinberg, Israel Herbert. Preparation and method of use of enzyme effective for conversion and detection of carbon monoxide. 4,071,037, Cl. 131-266.000.
Schellhammer, Carl-Wolfgang: *See*—
Schroeder, Josef; and Schellhammer, Carl-Wolfgang, 4,071,466, Cl. 252-301.220.
Schera, Enos L., Jr. Motion operated power apparatus. 4,071,114, Cl. 185-30.000.
Schering Corporation: *See*—
Green, Michael J.; and Shue, Ho-Jane, 4,071,626, Cl. 424-241.000.
Scherrer, Herbert; Bopp, Ernst; and Cecchetto, Ennio, to Franz Buttner AG. Cassette for dye impregnated ribbon. 4,071,133, Cl. 197-168.000.
Schick, Gunther, to Grapha-Holding AG. High performance sheet-feeder mechanism. 4,071,234, Cl. 271-11.000.
Schimmelman, Arthur H., to Precision Dynamics Corporation. Crimping tool. 4,070,745, Cl. 29-268.000.
Schindler, Hans-Dieter, deceased: *See*—
Kummer, Rudolf; Schwirten, Kurt; Schindler, Hans-Dieter, deceased; Lang nee Schindler, Ute, heir-at-law; and Schindler, Rainer, heir-at-law, 4,071,563, Cl. 260-601.00R.
Schindler, Maria Elisabeth, heir-at-law: *See*—
Kummer, Rudolf; Schwirten, Kurt; Schindler, Hans-Dieter, deceased; Lang nee Schindler, Ute, heir-at-law; and Schindler, Rainer, heir-at-law, 4,071,563, Cl. 260-601.00R.
Schindler, Rainer, heir-at-law: *See*—
Kummer, Rudolf; Schwirten, Kurt; Schindler, Hans-Dieter, deceased; Lang nee Schindler, Ute, heir-at-law; and Schindler, Rainer, heir-at-law, 4,071,563, Cl. 260-601.00R.
Schlaepfer, Robert J., to Jacob Schlaepfer & Co. A.G. Decoration of sheet materials. 4,071,387, Cl. 156-148.000.
Schlatter, James C.; and Taylor, Kathleen C., to General Motors Corporation. Process for improved 3-way emission control. 4,071,600, Cl. 423-213.700.
Schlau, Floyd E.; Morrison, Howard J.; and Keller, Albert G., to Marvin Glass & Associates. Stamp design kit. 4,070,967, Cl. 101-301.000.
Schlesinger, Sheldon I.; and Cochran, Veronica, to American Can Company. Copolymer of glycidyl methacrylate and allyl glycidyl ether. 4,071,671, Cl. 526-89.000.
Schloemann-Siemag Aktiengesellschaft: *See*—
Bollig, Georg; and Streubel, Hans, 4,071,073, Cl. 164-448.000.
Bollig, Georg; Streubel, Hans; and Kolakowski, Manfred, 4,071,074, Cl. 164-448.000.
Schlumberger & Cie: *See*—
Herubel, Jean Frederic, 4,070,732, Cl. 19-236.000.
Schmeisser, Walter; and Talasz, Johann, to J. M. Voith GmbH. Apparatus for shielding moving parts in fluid-operated machines. 4,071,128, Cl. 192-133.000.
Schmelzer Corporation: *See*—
Benjamin, Benjamin C., 4,071,119, Cl. 188-298.000.
Schmelzer, Heinz: *See*—
Werner, Gerhard; Grafe, Peter; Sattelmeyer, Richard; and Schmelzer, Heinz, 4,071,676, Cl. 526-283.000.
Schmidt, Gunther, to Saint-Gobain Industries. Apparatus for thermal tempering sheets of glass. 4,071,346, Cl. 65-351.000.
Schmidt, Horst: *See*—
Leitz, Ludwig; Heitmann, Knut; and Schmidt, Horst, 4,071,772, Cl. 250-558.000.
Schmidt, Oskar. Molded vehicular tire with internal reinforcing webs. 4,071,070, Cl. 152-333.000.
Schmiesing, Gregory. Feed bunk structure. 4,070,991, Cl. 119-58.000.
Schneehage, Hans Henning: *See*—
Koester, Eberhard; Wunsch, Gerd; Schoenafinger, Eduard; and Schneehage, Hans Henning, 4,071,610, Cl. 423-634.000.
Schneider, Eckart: *See*—
Leitz, Ludwig; Heitmann, Knut; Schneider, Eckart; and Schaefer, Klaus Dieter, 4,071,297, Cl. 356-4.000.
Schneider, Fredric H. On-site construction of roof trusses. 4,071,061, Cl. 144-314.00R.
Schneider, Raymond C.; and Pelligrino, Paul A., to Twin Disc, Incorporated. Swing control for crane. 4,070,926, Cl. 74-730.000.
Schneider, Richard: *See*—
Russo, Roland; and Schneider, Richard, 4,071,835, Cl. 335-133.000.
Schneppendahl, Richard; Kramer, Heinrich; and Pepping, Franz, to Nova-Lux-Gesellschaft Brandenburg & Co. Light diffuser and lamp incorporating the same. 4,071,750, Cl. 362-217.000.
Schoeller, Christina: *See*—
Steinlein, Rudolf F.; and Schoeller, Christina, 4,071,162, Cl. 220-21.000.
Schoeller International GmbH & Co. KG: *See*—
Steinlein, Rudolf F.; and Schoeller, Christina, 4,071,162, Cl. 220-21.000.
Schoen, Lowhardt A. A., to Stamicarbon, N.V. Preparation of lactone polyesters. 4,071,507, Cl. 260-78.30R.
Schoen, Roy C., to General Motors Corporation. DC motor with permanent magnet retaining structure. 4,071,794, Cl. 310-154.000.
Schoenafinger, Eduard: *See*—
Koester, Eberhard; Wunsch, Gerd; Schoenafinger, Eduard; and Schneehage, Hans Henning, 4,071,610, Cl. 423-634.000.
Scholey, Stuart: *See*—
Hague, David P.; Malkani, Dalip T.; Middlemiss, Andrew; and Scholey, Stuart, 4,070,739, Cl. 29-18.000.
Schoppee, Lawrence W., to Package Machinery Company. Gum stick wrapping machine. 4,070,851, Cl. 53-228.000.
Schorsch, Eugene; and Sutherland, Spurgen, to Sun Shipbuilding & Dry Dock Company. Ship performance analyzer. 4,071,898, Cl. 364-551.000.
Schott, Marcel: *See*—
Masclet, Jean; and Schott, Marcel, 4,071,284, Cl. 303-63.000.
Schreyer, Kenneth D.; and Rohosy, Soma M., to Columbus McKinnon Corporation. Chain hook. 4,070,823, Cl. 59-93.000.
Schriber, Gene Arnold: *See*—
Maeder, Heinz Bernhard; and Schriber, Gene Arnold, 4,071,784, Cl. 307-279.000.
Schrock, Wilfried: *See*—
Konig, Hans-Bodo; Metzger, Karl Georg; and Schrock, Wilfried, 4,071,683, Cl. 544-28.000.
Schroeder, Josef; and Schellhammer, Carl-Wolfgang, to Bayer Aktiengesellschaft. Optical brighteners. 4,071,466, Cl. 252-301.220.
Schuldt, Theodore J., to Rockwell International Corporation. Profile warning generator with anticipation of warning condition. 4,071,894, Cl. 364-430.000.
Schulman, Joseph H., to Pacesetter Systems Inc. Implantable living tissue stimulators. 4,071,032, Cl. 128-419.00P.
Schultz, Hans-Joachim: *See*—
Bubik, Alfred; Reutter, Siegfried; Schultz, Hans-Joachim; and Stotz, Wolf-Gunter, 4,071,401, Cl. 162-300.000.
Schupner, Willard J., to Efdyn Corporation. Adjustable shock absorber. 4,071,122, Cl. 188-285.000.
Schuster, Albert J., Jr.; and Martin, John, to Dow Chemical Company, The. Process for producing 3-substituted 1,2,4-triazines. 4,071,684, Cl. 544-182.000.
Schwarz, Hans J., to Sandoz, Inc. 4-(Acyloxyphenyl)-quinazolin-2(1H)-ones. 4,071,516, Cl. 260-251.0QB.
Schwemer, Warren C., to Advanced Technology Center, Inc. Method of producing homogeneous carbon and graphite bodies. 4,071,604, Cl. 423-445.000.
Schwirten, Kurt: *See*—
Kummer, Rudolf; Schwirten, Kurt; Schindler, Hans-Dieter, deceased; Lang nee Schindler, Ute, heir-at-law; and Schindler, Rainer, heir-at-law, 4,071,563, Cl. 260-601.00R.
Schwuger, Milan Johann; Smolka, Heinz; Altenschopfer, Theodor; and Rostek, Manfred, to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA). Method of mechanical dishwashing and compositions. 4,071,377, Cl. 134-29.000.
Scibilia, Peter A., to Polaroid Corporation. Photographic apparatus including improved aperture plate. 4,071,294, Cl. 352-72.000.
Science Union et Cie, Societe Francaise de Recherche Medicale: *See*—
Servier, Jacques, 4,071,629, Cl. 424-251.000.
Scott, Charles E., to P. R. Mallory & Co. Inc. Patch cord timer. 4,071,773, Cl. 307-141.000.
Scott, John J., to Norton Company. Method of producing abrasive grits. 4,070,796, Cl. 51-309.00R.
Scragg, Robert L.; and Parker, Alfred B., to Solar Reactor Corporation. Solar reactor combustion chamber. 4,070,861, Cl. 60-641.000.
Seager, Reuben, to Raymond Lee Organization. Fishing rod support device. 4,071,219, Cl. 248-534.000.
Secretary of State for Industry in Her Britannic Majesty's Government of the United Kingdom of Great Britain & Northern Ireland, The: *See*—
Scamaton, William Bertram, 4,070,970, Cl. 102-28.00R.
Sederquist, Richard A., to United Technologies Corporation. Steam reforming process and apparatus therefor. 4,071,330, Cl. 48-94.000.
Sedlmayer, Franz; Baron, Paul; and Seifert, Klaus, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Off-shore drilling platform and method of mounting. 4,070,868, Cl. 61-91.000.
Seely, John Hunter: *See*—
Johnson, Edwin Samuel; and Seely, John Hunter, 4,071,622, Cl. 424-177.000.
Sefton, Verner B.: *See*—
Masters, Ian M.; Bolton, Gerald L.; and Sefton, Verner B., 4,071,421, Cl. 204-96.000.
Seger, Fritz O., to Copes-Vulcan, Inc. Variable orifice desuperheater. 4,071,586, Cl. 261-62.000.
Seifert, Klaus: *See*—
Sedlmayer, Franz; Baron, Paul; and Seifert, Klaus, 4,070,868, Cl. 61-91.000.
Seiler, Ronald: *See*—
Graves, Thomas W.; and Seiler, Ronald, 4,071,071, Cl. 157-13.000.
Seltzer, Raymond; and Gordon, David A., to Ciba-Geigy Corporation. Hydantoin diglycidyl compounds. 4,071,477, Cl. 260-2.00N.
Sencer, Mevhibe Gulay, to Northern Telecom Limited. Telephone speech network. 4,071,713, Cl. 179-81.00A.
Senes, Michel; Le Goff, Yannick; and Gourdier, Jean-Francois, to Societe Chimique de la Grande Paroisse, Azote et Produits Chi-

miques. Catalyst for the purification of effluent gases containing oxides of nitrogen as impurity. 4,071,472, Cl. 252-455.00R.

Senil Nominnees Pty. Ltd.: *See—*
Lines, Lancelot H., 4,070,938, Cl. 83-71.000.

Serenko, Alexandr Nikitich: *See—*
Zarechensky, Anatoly Vasilievich; Kolechko, Alexei Afanasievich; Manov, Vladimir Mikhailovich; Korjukova, Alla Grigorievna; Savran, Vasily Grigorievich; and Serenko, Alexandr Nikitich, 4,071,734, Cl. 219-146.310.

Servier, Jacques, to Science Union et Cie, Societe Francaise de Recherche Medicale. Novel pharmaceutical compositions and method for treating psychasthenia. 4,071,629, Cl. 424-251.000.

Seto, Stanford P.: *See—*
Stenger, Richard E.; Ekstedt, Edward E.; Richey, John M.; and Seto, Stanford P., 4,070,826, Cl. 60-39.660.

Setrin, Morton, to United States of America, Air Force. Self synchronizing convolver system. 4,071,828, Cl. 325-65.000.

Severin, Vasily Fedorovich: *See—*
Zherdev, Anatoly Vasilievich; Yakimenko, Grigory Savvich; Gritsuk, Lev Dmitrievich; Gorbik, Anatoly Stepanovicy; Belkin, Evgeny Grigorievich; Tseluiko, Jury Ivanovich; Gorodetsky, Yakov Izrailievich; Severin, Vasily Fedorovich; and Tolochko, Alexei Ivanovich, 4,071,230, Cl. 266-193.000.

Shaare Zedek Hospital: *See—*
Halperin, Levi Ytzhak; Zioni, Dov; and Bennet, David, 4,071,116, Cl. 187-29.00R.

Shapiro, Stanley: *See—*
Cheskis, Harvey P.; Shapiro, Stanley; and Crane, Jacob, 4,071,359, Cl. 75-160.000.

Shen, Tsung-Ying; and Wagner, Arthur F., to Merck & Co., Inc. Controlled partially cross-linked 3,3-ionenes. 4,071,478, Cl. 260-2.00R.

Sherk, Thomas Albert, to International Business Machines Corporation. Manufacturing process for gaseous discharge device. 4,071,287, Cl. 316-19.000.

Sherman, Roger M.: *See—*
Kinkead, Jordan A.; Pott, James T.; Sherman, Roger M.; and Sullivan, Eugene F., 4,071,152, Cl. 214-75.00R.

Sherritt Gordon Mines Limited: *See—*
Masters, Ian M.; Bolton, Gerald L.; and Sefton, Verner B., 4,071,421, Cl. 204-96.000.

Shibazaki, Kenji: *See—*
Murata, Tomoji; Nakamura, Yoshihiro; Shibazaki, Kenji; and Kuse, Matsuo, 4,071,721, Cl. 200-38.00B.

Shields, Walter A. Apparatus for holding hypodermic needles straight and placing sheaths thereon. 4,070,756, Cl. 29-809.000.

Shimba, Hiroshi: *See—*
Usui, Kuniharu; Shimba, Hiroshi; Nakagaki, Kunihiro; and Mukunashi, Hiroaki, 4,071,388, Cl. 156-157.000.

Shimizu, Osamu: *See—*
Sumida, Shizuo; Nii, Kazuo; Shimizu, Osamu; Ueda, Atsushi; and Ishii, Mitsuaki, 4,071,889, Cl. 364-200.000.

Shimizu, Shinkichi: *See—*
Shiraishi, Tatsuo; Shimizu, Shinkichi; and Shindo, Tadashi, 4,071,601, Cl. 423-239.000.

Shimizu, Susumu: *See—*
Aoki, Katsumichi; Shimizu, Susumu; Satake, Keigo; Yamazaki, Shiro; and Hatakeyama, Nobuo, 4,071,633, Cl. 424-324.000.

Shimizu, Takashi: *See—*
Miyamatsu, Yasunori; Yasumuro, Hisakazu; Miyata, Kenichi; Shimizu, Takashi; and Matsuoka, Kikuo, 4,070,885, Cl. 72-46.000.

Shimoda, Sadao: *See—*
Engelbrecht, Hans, 4,071,079, Cl. 165-48.000.

Shimono, Junichi. Pushbutton operated door locks. 4,070,881, Cl. 70-315.000.

Shindo, Tadashi: *See—*
Shiraishi, Tatsuo; Shimizu, Shinkichi; and Shindo, Tadashi, 4,071,601, Cl. 423-239.000.

Shinitzky, Meir; and Bruck, Abraham, to Elscint, Ltd. Method for evaluating perinatal lung maturity. 4,071,770, Cl. 250-461.00B.

Shinpo, Masanori: *See—*
Takanashi, Yukio; Sato, Fumiyuki; and Shinpo, Masanori, 4,071,803, Cl. 313-409.000.

Shipov, Stanislav Valeryanovich: *See—*
Zubarev, Anatoly Ivanovich; Osipovsky, Lev Fedorovich; and Shipov, Stanislav Valeryanovich, 4,071,093, Cl. 173-105.000.

Shiraishi, Tatsuo; Shimizu, Shinkichi; and Shindo, Tadashi, to Sumitomo Chemical Company, Limited. Selective removal of nitrogen oxides from waste gases using V-Mo-W catalysts. 4,071,601, Cl. 423-239.000.

Shiraogawa, Michio: *See—*
Koyano, Hitoshi; Sugaya, Nobuo; and Shiraogawa, Michio, 4,071,849, Cl. 346-1.000.

Shorter, Myron L., Jr. Channel connector for floating docks. 4,070,980, Cl. 114-263.000.

Shu, Chi Chen: *See—*
Ribbecke, Lawrence F.; and Shu, Chi Chen, 4,071,514, Cl. 260-22M.

Shue, Ho-Jane: *See—*
Green, Michael J.; and Shue, Ho-Jane, 4,071,626, Cl. 424-241.000.

Shuster, James C.: *See—*
Moomey, Henry E., Jr., 4,070,840, Cl. 52-489.000.

Shutt, George T. Method for treating oxidized steel surfaces. 4,071,380, Cl. 148-6.15R.

Sicre, Jean-Luc, to Societe Francaise d'Equipements pour la Navigation Aerienne. Flying method and system using total power for an aircraft. 4,071,893, Cl. 364-427.000.

Siddall, Graham John, to Rank Organisation Limited, The. Measuring apparatus. 4,070,762, Cl. 33-174.00Q.

Siegmund, Walter P., to American Optical Corporation. Method of making intraocular lenses. 4,071,343, Cl. 65-23.000.

Siemens Aktiengesellschaft: *See—*
Alexandrescu, Mircea, 4,071,863, Cl. 360-101.000.
Dotzer, Richard; Hauschildt, Hans-Georg; Todt, Enno, deceased; Todt, Susanne, heir; Todt, Ruth Katharina, heir; and Todt, Ernst Josef, heir, 4,071,526, Cl. 260-299.000.
Lichti, Reiner, 4,071,130, Cl. 197-1.00R.

Siemonsen, Hans-Peter: *See—*
Werner, Alfons; Roth, Mario; Siemonsen, Hans-Peter; and Winandi, Johann, 4,071,345, Cl. 65-273.000.

Sierputowski, Piotr: *See—*
Ostrowski, Jerzy; Sierputowski, Piotr; Turkowski, Lukasz; Jablkiewicz, Jerzy; Pacholski, Jan; and Jedryka, Tadeusz, 4,070,812, Cl. 57-58.890.

Signode Corporation: *See—*
Turek, Clarence W.; Aronson, Aaron B.; and Wittlock, Dale C., 4,071,131, Cl. 197-6.400.

Silka, Adolf Nikolaevich: *See—*
Fidchunov, Leonid Nikolaevich; Balyk, Stanislav Sergeevich; Silka, Adolf Nikolaevich; Kulakov, Nikolai Konstantinovich; Bakhtarov, Leonid Fedorovich; Azimov, Alexandr Abramovich; Davydenko, Vladimir Mikhailovich; Balitsky, Nikolai Vasilievich; Likhogub, Evgeny Petrovich; and Dorfman, Gersh Abramovich, 4,071,414, Cl. 201-40.000.

Sillion, Bernard: *See—*
Cohen, Choua; and Sillion, Bernard, 4,071,459, Cl. 252-50.000.

Simich, Emil, to A. J. Gerrard & Company. Pre-notched tieing wires. 4,070,733, Cl. 24-27.000.

Sinke, Gerard C., to Dow Chemical Company, The. Method of removing sulfur from coal. 4,071,328, Cl. 44-1.00R.

Sinnard, Harry W.: *See—*
McDaniel, John H.; Sinnard, Harry W.; and Thomas, Robert W., 4,070,940, Cl. 83-464.000.

Sitton, Willard J.: *See—*
Moran, George A., Jr.; and Sitton, Willard J., 4,071,041, Cl. 137-246.220.

Sivertsen, Marvin L.: *See—*
Pury, Thomas; Konle, Robert L.; and Sivertsen, Marvin L., 4,071,767, Cl. 250-444.000.

Skakunov, Mikhail Grigorievich. Floating roof of a tank for storing liquids. 4,071,164, Cl. 220-224.000.

Skatsche, Othmar; Thien, Gerhard; and Fachbach, Heinz, to List, Hans. Low-noise-level internal combustion engine. 4,071,008, Cl. 123-198.00E.

SKF Kugellagerfabriken GmbH: *See—*
Goldammer, Georg; and Beitzinger, Kurt, 4,070,814, Cl. 57-89.000.

Skis Rossignol S.A. Club Rossignol S.A.: *See—*
Legrand, Maurice Francois; and Cholat-Serpoud, Gerard, 4,071,264, Cl. 280-610.000.

Sklar, Stanley, to American Home Products Corporation. Stabilization of oxygen sensitive dose forms. 4,071,620, Cl. 424-175.000.

Skurkiss, Peter Kenny: *See—*
Koontz, Donald Eldridge; and Skurkiss, Peter Kenny, 4,071,417, Cl. 204-38.00B.

Skwirut, Henry: *See—*
Evans, George S.; and Skwirut, Henry, 4,071,288, Cl. 316-19.000.

Sladdin, Stuart Rodney; and Thorneycroft, Malcolm, to Charles Churchill Limited. Machine tools. 4,070,934, Cl. 82-2.00R.

Slovenske zelezarne Tovarna Verig s.p.o.: *See—*
Raspet, Jernej; and Zagar, Marjan, 4,071,069, Cl. 152-213.00A.

Slusarchyk, William A.: *See—*
Dolfini, Joseph Edward; Slusarchyk, William A.; and Koster, William Henry, 4,071,682, Cl. 544-21.000.

Smit Nijmegen B.V.: *See—*
Graat, Johannes W., 4,071,322, Cl. 23-262.000.

Smith, Arthur C. Starting apparatus for rodeo events. 4,070,988, Cl. 119-15.50A.

Smith International, Inc.: *See—*
Kellner, Jackson M., 4,071,285, Cl. 308-4.00A.

Smith, Jackson A. Crimping device. 4,070,894, Cl. 72-292.000.

Smith, John L.; and Alexander, Clair B., to Ibec Industries, Inc. Proximity switch for fluid cylinders. 4,071,725, Cl. 200-82.00E.

Smith, Joseph A.: *See—*
Mattner, Paul G.; and Smith, Joseph A., 4,071,557, Cl. 260-570.0AB.

Smith, Lewis S.: *See—*
Vanzo, Edward; and Smith, Lewis S., 4,071,670, Cl. 526-88.000.

Smith, Raymond E., Jr. Aerial lift. 4,070,807, Cl. 52-109.000.

Smith, Robert H., to Atlantic Richfield Company. Denitrogenation of syncrude. 4,071,435, Cl. 208-91.000.

Smithen, Carey Ernest: *See—*
Hassall, Cedric Herbert; Johnson, William Henry; Krohn, Antonin; Smithen, Carey Ernest; and Thomas, William Anthony, 4,071,525, Cl. 260-295.0AM.

Smolka, Heinz: *See—*
Schwuger, Milan Johann; Smolka, Heinz; Altenschopfer, Theodor; and Rostek, Manfred, 4,071,377, Cl. 134-29.000.

Smolyanitsky, Boris Nikolaevich: *See—*
Tkach, Khaim Berkovich; Kostylev, Alexandr Dmitrievich; Tupitsyn, Konstantin Konstantinovich; Gurkov, Konstantin Stepanovich; Klimashko, Vladimir Vasilievich; Rozhkov, Leonid Georgievich; Bondar, Mikhail Jurievich; and Smolyanitsky, Boris Nikolaevich, 4,070,948, Cl. 91-234.000.

Snamprogetti S.p.A.: *See*—
Ancillotti, Francesco; Oriani, Gianni; and Pescarollo, Ermanno, 4,071,567, Cl. 260-614.00A.
Sneed, Robert C.; and Young, Joseph C., to Fas-Line Sales and Rentals, Inc. Laying of flexible pipe. 4,071,203, Cl. 242-86.600.
Snyder, Donald L.: *See*—
Brunnett, Carl J.; Cox, Jerome R., Jr.; Snyder, Donald L.; and Mattson, Rodney A., 4,071,769, Cl. 250-445.00T.
Sobecks, Ronald S., to Design & Manufacturing Corporation. Thermal fluid displacement actuator. 4,070,859, Cl. 60-530.000.
Societa' Italiana Resine S.I.R. S.p.A.: *See*—
Piccolo, Luigi; Calcagno, Benedetto; Ghirga, Marcello; and Paolinelli, Antonio, 4,071,347, Cl. 71-31.000.
Societe Anonyme D.B.A.: *See*—
Courbot, Pierre; and Meyer, Yves, 4,071,123, Cl. 188-331.000.
S.A. des Anciens Etablissements Paul Wurth: *See*—
Legille, Edouard; and Mahr, Rene N., 4,071,166, Cl. 222-1.000.
Societe Anonyme des Usines Chausson: *See*—
Plegat, Alain Edouard, 4,071,181, Cl. 228-43.000.
Societe Chimique de la Grande Paroisse, Azote et Produits Chimiques: *See*—
Senes, Michel; Le Goff, Yannick; and Gourdier, Jean-Francois, 4,071,472, Cl. 252-455.00R.
Societe Chimique des Charbonnages: *See*—
Begou, Patrick, 4,071,493, Cl. 260-42.130.
Societe des Telephones Picart Lebas: *See*—
Richard, Pierre D.; and Tessier, Claude R., 4,071,715, Cl. 179-90.00K.
Societe Francaise d'Equipements pour la Navigation Aerienne: *See*—
Sicre, Jean-Luc, 4,071,893, Cl. 364-427.000.
Societe Lorraine de Laminage Continu: *See*—
Rault, Daniel Raymond, 4,071,657, Cl. 428-646.000.
Societe Suisse pour l'Industrie Horlogere Management Services S.A.: *See*—
Zumsteg, Alphonse Ernst; Engdahl, Jean; and Huguenin, Raymond, 4,071,797, Cl. 310-361.000.
Socomaten: *See*—
Nicou, Oliver; and Lumbroso, Roger, 4,071,431, Cl. 204-301.000.
Soda, Kenji; Tanaka, Hidehiko; Nakazawa, Hidetsugu; and Mitsugi, Koji, to Ajinomoto Co., Inc. Method of producing sulfur containing L-amino acids. 4,071,405, Cl. 195-29.000.
Sodia S.A.: *See*—
Soulat, Rene, 4,070,809, Cl. 56-13.900.
Soeda, Yuji: *See*—
Yamada, Masami; and Soeda, Yuji, 4,070,895, Cl. 72-334.000.
Soga, Kazuo: *See*—
Ikeda, Sakuji; and Soga, Kazuo, 4,071,667, Cl. 526-11.100.
Sohlberg, Pentti Aimo Johannes. Supporting framework for a shelter shed. 4,070,846, Cl. 52-641.000.
Solar Energy For The Family Inc.: *See*—
Henderson, Thomas D., 4,071,016, Cl. 126-270.000.
Solar Reactor Corporation: *See*—
Scragg, Robert L.; and Parker, Alfred B., 4,070,861, Cl. 60-641.000.
Solomon, Paul W.: *See*—
Uraneck, Carl A.; Burleigh, John E.; and Solomon, Paul W., 4,071,679, Cl. 526-338.000.
Solomons, William Ebenezer: *See*—
Mathison, Ian William; Solomons, William Ebenezer; and Jones, Raymond Henry, 4,071,562, Cl. 260-600.00R.
Somogyi, Bela, to Hughes Aircraft Company. Electric watch battery contact spring. 4,070,821, Cl. 58-23.0BA.
Sonetake, Kazunori: *See*—
Nishino, Atsushi; Sonetake, Kazunori; and Kumano, Hiroshi, 4,071,636, Cl. 427-2.000.
Sony Corporation: *See*—
Kihara, Nobutoshi; and Morio, Minoru, 4,071,856, Cl. 360-73.000.
Yamanaka, Seisuke, 4,071,853, Cl. 358-41.000.
Soulat, Rene, to Sodia S.A. Automatic sugar cane harvesting machine. 4,070,809, Cl. 56-13.900.
Spargo, John A.: *See*—
Mahler, Harry H.; and Spargo, John A., 4,070,778, Cl. 40-124.100.
Sperry, Peter R.: *See*—
Emmons, William D.; Nyi, Kayson; and Sperry, Peter R., 4,071,489, Cl. 260-22.0CB.
Sperry Rand Corporation: *See*—
Cloke, Robert L., 4,071,832, Cl. 331-117.00R.
Ignasiak, Stanley F., 4,071,640, Cl. 427-215.000.
Spitz, Melvin P. Box spring retainer. 4,070,718, Cl. 5-207.000.
Square D Company: *See*—
Cook, James W.; Khalid, Joseph M.; and Oster, Clark L., 4,071,836, Cl. 335-195.000.
Staats, Henry N.; and Wiermanski, Jerome J., to General Binding Corporation. Identification card pouch. 4,070,774, Cl. 40-2.200.
Stackman, Robert W.; and Conciatori, Anthony B., to Celanese Corporation. High temperature polyester resins from 4,4'-bis(p-hydroxyphenoxy)diphenyl ether and terephthalic acid. 4,071,499, Cl. 260-47.00C.
Stacy, Hugh E., Jr. Disc trench filler for a no-till planter. 4,070,974, Cl. 111-85.000.
Staggers, John O., to Foote Mineral Company. Recovery of vanadium from pig iron. 4,071,355, Cl. 75-30.000.
Staley, Lester K.: *See*—
Hopwood, Francis W.; Staley, Lester K.; and Tolj, Henry D., 4,071,844, Cl. 343-17.20R.
Stamicarbon, N.V.: *See*—
Schoen, Lowhardt A. A., 4,071,507, Cl. 260-78.30R.
Stanford Research Institute: *See*—
Falconer, David G., 4,071,298, Cl. 356-73.000.
Stanwick, Casmer P.: *See*—
Armor, Anthony F.; and Stanwick, Casmer P., 4,071,791, Cl. 310-59.000.
Stark, Ernst-Joachim; Vanhaiden, Peter; and Klinkenberg, Herbert, to Dynamit Nobel Aktiengesellschaft. Reinforced polyvinylidene fluoride molding compositions. 4,071,495, Cl. 260-42.180.
Starks, Charles M.: *See*—
Leach, Bruce E.; and Starks, Charles M., 4,071,566, Cl. 260-621.00D.
Stasko, William. Safety attachment for invalid lift and transport apparatus. 4,070,721, Cl. 5-89.000.
State of Israel and Isorad Isotope and Radiation Enterprise, Ltd., The: *See*—
Eisenberg, Eli; Altmann, Gideon; Bogokovsky, Bianca; and Lapidot, Mordechai, 4,071,412, Cl. 195-102.000.
Stauffer Chemical Company: *See*—
Arneklev, Duane R.; and Baker, Don R., 4,071,349, Cl. 71-88.000.
Arneklev, Duane R.; and Baker, Don R., 4,071,350, Cl. 71-100.000.
Arneklev, Duane R.; and Baker, Don R., 4,071,351, Cl. 71-100.000.
Arneklev, Duane R.; and Baker, Don R., 4,071,352, Cl. 71-100.000.
Arneklev, Duane R.; and Baker, Don R., 4,071,353, Cl. 71-100.000.
Mihailovski, Alexander, 4,071,545, Cl. 260-429.700.
Pallos, Ferenc M., 4,071,556, Cl. 260-564.0RF.
Pitt, Harold M., 4,071,423, Cl. 204-158.00R.
Yu, Arthur J.; and Anderson, Donald F., 4,071,675, Cl. 526-193.000.
Steckler, Robert, to Plastomedical Sciences, Inc. Anionic hydrogels based on hydroxyalkyl acrylates and methacrylates. 4,071,508, Cl. 260-79.3MU.
Stedman, Robert N., to Caterpillar Tractor Co. Forward dumping truck construction. 4,071,277, Cl. 298-22.00P.
Steiger, Anton, to Sulzer Brothers Limited. Reciprocating internal combustion engine for the combustion of finely divided solid fuel. 4,070,996, Cl. 123-23.000.
Steiger, Anton, to Sulzer Brothers Limited. Reciprocating internal combustion engine using powdered solid fuel. 4,070,997, Cl. 123-23.000.
Stein, Robert George; and Couch, Terry Lee, to Abbott Laboratories. Phosphoramidates and thiophosphoramidates as pesticides. 4,071,533, Cl. 260-332.500.
Stein, Thomas R.: *See*—
Milstein, Donald; and Stein, Thomas R., 4,071,574, Cl. 260-676.00R.
Steinberg, David Herbert: *See*—
Dexter, Martin; and Steinberg, David Herbert, 4,071,497, Cl. 260-45.85B.
Steinbichler, Alfred, to Max-Planck-Gesellschaft zur Forderung der Wissenschafter e.V. Multiple test X-ray goniometer. 4,071,758, Cl. 250-277.0CH.
Steinhauer, Alfred F., to Dow Chemical Company, The. Stable cleaning agents of hypochlorite bleach and detergent. 4,071,463, Cl. 252-103.000.
Steinke, James Marion; and Gaskins, Justin, to TRW, Inc. Endless inked ribbon cartridge. 4,071,132, Cl. 197-168.000.
Steinlein, Rudolf F.; and Schoeller, Christina, to Schoeller International GmbH & Co. KG. Bottle pack crate and bottle pack therefor. 4,071,162, Cl. 220-21.000.
Stenger, Richard E.; Ekstedt, Edward E.; Richey, John M.; and Seto, Stanford P., to General Electric Company. Low pressure fuel injection system. 4,070,826, Cl. 60-39.660.
Sternby, Arthur J.; and Cruea, Ronald D., to Black Clawson Company, The. Method of and apparatus for flow spreading. 4,071,193, Cl. 239-11.000.
Stewart, Brian: *See*—
Muhlfelder, Ludwig; Keigler, John Edward; and Stewart, Brian, 4,071,211, Cl. 244-165.000.
Stewart, John W.; and Bruckner, Ronald L., to NCR Corporation. Drive circuit. 4,071,877, Cl. 361-152.000.
Stockebrand, Thomas C.; Doane, Russell C.; and Morganstern, Michael D., to Digital Equipment Corporation. Time-multiplexed output devices in video terminal systems. 4,071,910, Cl. 364-900.000.
Stockum, Glenn Francis, to Arbrook, Inc. Medical glove and method. 4,070,713, Cl. 2-168.000.
Stone, Barry N. Electric toilet tissue dispenser. 4,071,200, Cl. 242-55.200.
Stone, Milton, to Pettibone Corporation. Level control system for a rotary cone-type feed hopper. 4,071,168, Cl. 222-56.000.
Stork Amsterdam B.V.: *See*—
Vertegaal, Jacobus Gerardus, 4,070,964, Cl. 101-120.000.
Stork Friesland B.V.: *See*—
Kamphuis, Gerrit George, 4,070,766, Cl. 34-12.000.
Stotz, Wolf-Gunter: *See*—
Bubik, Alfred; Reutter, Siegfried; Schultz, Hans-Joachim; and Stotz, Wolf-Gunter, 4,071,401, Cl. 162-300.000.
Strassel, Albert, to Produits Chimiques Ugine Kuhlmann. Method of coating flexible substrates with polyurethane-polyurea elastomers and products produced thereby. 4,071,390, Cl. 156-239.000.
Strathmann, Heinrich, to Forschungsinstitute Bergof GmbH. Composite asymmetrical membranes. 4,071,590, Cl. 264-45.100.
Strauss, Edgar, to Ruti Machinery Works Ltd. Undulated shed loom with filling-thread clamping device. 4,071,051, Cl. 139-436.000.
Stretten, Ivan J. Coil-end pealer and debender. 4,070,891, Cl. 72-183.000.

Streubel, Hans: *See*—
Bollig, Georg; and Streubel, Hans, 4,071,073, Cl. 164-448.000.
Bollig, Georg; Streubel, Hans; and Kolakowski, Manfred, 4,071,074, Cl. 164-448.000.

Stromnes, Axel: *See*—
Herron, Lorne Robert; and Stromnes, Axel, 4,071,095, Cl. 173-152.000.

Strongin, Ned; and Garrett, Isabel, to Ned Strongin Associates, Inc. Doll with releasably-attached hair pieces. 4,070,790, Cl. 46-172.000.

Stryker Corporation: *See*—
Richmond, James W.; and Rhodes, Earl H., Jr., 4,071,029, Cl. 128-305.000.

Stubbings, James Henry, to Potomac Applied Mechanics, Inc. Method and apparatus for cutting sheet metal wrappers or the like. 4,070,890, Cl. 72-129.000.

Studebaker, Alden Henry. Engine efficiency. 4,070,971, Cl. 123-198.00F.

Sturgeon, Michael E.: *See*—
Van Ostenbridge, Ron; and Sturgeon, Michael E., 4,071,102, Cl. 177-165.000.

Stynes, James A., to N L Industries, Inc. Method for producing capacitors and ceramic body therefore. 4,071,878, Cl. 361-307.000.

Sugaya, Nobuo: *See*—
Koyano, Hitoshi; Sugaya, Nobuo; and Shiraogawa, Michio, 4,071,849, Cl. 346-1.000.

Sugiyama, Hironari: *See*—
Hayashi, Eiichi; Takita, Kiyoshi; Sugiyama, Hironari; and Nezu, Yukio, 4,071,534, Cl. 260-343.700.

Sugiyama, Hiroshige; and Yasuda, Hiroshi, to Toyo Boseki Kabushiki Kaisha. Polyester fiber having anti-pilling property and its production. 4,071,502, Cl. 260-75.00T.

Sullivan, Eugene F.: *See*—
Kinkead, Jordan A.; Pott, James T.; Sherman, Roger M.; and Sullivan, Eugene F., 4,071,152, Cl. 214-75.00R.

Sulzer Brothers Limited: *See*—
Steiger, Anton, 4,070,996, Cl. 123-23.000.
Steiger, Anton, 4,070,997, Cl. 123-23.000.

Sumida, Shizuo; Nii, Kazuo; Shimizu, Osamu; Ueda, Atsushi; and Ishii, Mitsuaki, to Mitsubishi Denki Kabushiki Kaisha. Central processing apparatus for generating and receiving time division multiplex signals. 4,071,889, Cl. 364-200.000.

Sumitomo Chemical Company, Limited: *See*—
Shiraishi, Tatsuo; Shimizu, Shinkichi; and Shindo, Tadashi, 4,071,601, Cl. 423-239.000.
Yamahara, Takeshi; Takano, Tetsuo; Tamura, Mitsuhisa; and Yoshihara, Hiroshi, 4,071,569, Cl. 260-621.00C.

Sumitomo Electric Industries, Ltd.: *See*—
Usui, Kuniharu; Shimba, Hiroshi; Nakagaki, Kunihiro; and Mukunashi, Hiroaki, 4,071,388, Cl. 156-157.000.

Sun Oil Company: *See*—
Hensel, Wilber M., Jr., 4,071,099, Cl. 175-59.000.

Sun Shipbuilding & Dry Dock Company: *See*—
Schorsch, Eugene; and Sutherland, Spurgen, 4,071,898, Cl. 364-551.000.

Sundstroem, Kurt Lage: *See*—
Wilton, Inga Elna Maria; Envall, Lennart Olof Gunnemar; Sundstroem, Kurt Lage; and Moran, David Patrick Joseph, 4,071,634, Cl. 426-604.000.

Suntech, Inc.: *See*—
Bahl, George R., 4,071,817, Cl. 324-30.00R.
Bennett, John D., 4,071,086, Cl. 166-177.000.
Hansel, William B., 4,071,059, Cl. 141-206.000.

Supernaw, Irwin R.; Arnold, Dan McCay; and Link, Arthur Jurgen, to Texaco Inc. Method for in situ evaluation of the source rock potential of earth formations. 4,071,755, Cl. 250-253.000.

Supran, Lyle David. Electrically conductive tennis ball. 4,071,242, Cl. 273-61.00R.

Susai, Sadao, to Daiwa Kogyo Co., Ltd. Method for protective coating the inside of surfaces of metal tubes by vapor deposition. 4,071,641, Cl. 427-234.000.

Suter, Fritz: *See*—
Aenishaenslin, Werner; Suter, Fritz; Pfeuti, Ulrich; and Haag, Paul, 4,070,965, Cl. 101-228.000.

Sutherland, Johnny L. Hunting blind boat cover. 4,070,722, Cl. 9-5.000.

Sutherland, Spurgen: *See*—
Schorsch, Eugene; and Sutherland, Spurgen, 4,071,898, Cl. 364-551.000.

Sutton, William H., to International Nickel Company, Inc., The. Treatment of chromium-containing iron alloys. 4,071,416, Cl. 204-38.00R.

Suzuki, Hiroichi. Method of working for bending metal material and thereby obtained friction core plate of friction clutch. 4,071,127, Cl. 192-107.00R.

Suzuki, Masane; Kanaya, Motonori; and Matsuoka, Takeshi, to Fuji Photo Optical Co., Ltd. Holographic method for forming color holograms. 4,071,291, Cl. 350-3.500.

Swartzendruber, Ray E., to Chore-Time Equipment Inc. Feeder pan assembly. 4,070,990, Cl. 119-53.000.

Swift & Company: *See*—
Ramirez, Ernest R., 4,071,447, Cl. 210-44.000.
Russell, Frank B., 4,071,063, Cl. 150-12.000.

Swiss Aluminium Ltd.: *See*—
Friese, Gunther, 4,071,452, Cl. 210-189.000.

Sycor, Inc.: *See*—
Butsch, Otto R., 4,071,866, Cl. 360-106.000.

Symons Corporation: *See*—
Cody, David L., 4,070,845, Cl. 52-632.000.

Synair: *See*—
Gomberg, Edward N., 4,071,386, Cl. 156-113.000.

Szczesny, Adolf: *See*—
Jedo, Antoni; Jachna, Waclaw; and Szczesny, Adolf, 4,071,440, Cl. 209-44.000.

Szczypinski, Zbigniew: *See*—
Ciborowski, Stanislaw; Szczypinski, Zbigniew; Balcerzak, Kazimierz; Jaworski, Andrzej; Kasznia, Andrzej; Krzysztoforski, Andrzej; Kurowski, Stanislaw; Redzi, Jan; and Szparski, Jozef, 4,071,561, Cl. 260-586.00P.

Szeberenyi, Szabolcs: *See*—
Tuba, Zoltan; Marsai, Maria; Biro, Katalin; Szporny, Laszlo; Karpati, Egon; and Szeberenyi, Szabolcs, 4,071,515, Cl. 260-239.500.

Szparski, Jozef: *See*—
Ciborowski, Stanislaw; Szczypinski, Zbigniew; Balcerzak, Kazimierz; Jaworski, Andrzej; Kasznia, Andrzej; Krzysztoforski, Andrzej; Kurowski, Stanislaw; Redzi, Jan; and Szparski, Jozef, 4,071,561, Cl. 260-586.00P.

Szporny, Laszlo: *See*—
Tuba, Zoltan; Marsai, Maria; Biro, Katalin; Szporny, Laszlo; Karpati, Egon; and Szeberenyi, Szabolcs, 4,071,515, Cl. 260-239.500.

Szudarek, Robert G., to Essex Group, Inc. Electrical connector assembly for ribbon type electrical cable. 4,071,289, Cl. 339-17.00F.

Taft, Keith G.: *See*—
Legat, Wilhelm H.; Taft, Keith G.; and Tiefert, Karl H., 4,070,748, Cl. 29-577.00C.

Takahashi, Akio, to Hooker Chemicals & Plastics Corporation. Method of polymerizing vinyl halide with olefin polymers and copolymers and compositions thereof. 4,071,582, Cl. 260-878.00R.

Takahashi, Masaaki; Iizuka, Akira; and Asano, Kiro, to Kureha Kagaku Kogyo Kabushiki Kaisha. Method for the production of trans-4-aminomethyl cyclohexane-1-carboxylic acid. 4,071,553, Cl. 260-514.00J.

Takahashi, Shinkichi: *See*—
Marushima, Giichi; Tanaka, Hiroshi; Tosaka, Umi; Takahashi, Shinkichi; and Komiya, Takao, 4,071,361, Cl. 96-1.400.

Takahashi, Zyuro; and Hayashi, Chozo, to Ono Pharmaceutical Co., Ltd. Method for determining free fatty acids in blood serum using fatty acid activating enzymes. 4,071,413, Cl. 195-103.50R.

Takamatsu, Akira: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Hamada, Masa; Takamatsu, Akira; and Oki, Toshikazu, 4,071,411, Cl. 195-80.00R.

Takanashi, Yukio; Sato, Fumiyuki; and Shinpo, Masanori, to Tokyo Shibaura Electric Co., Ltd. Electron gun assembly. 4,071,803, Cl. 313-409.000.

Takano, Tetsuo: *See*—
Yamahara, Takeshi; Takano, Tetsuo; Tamura, Mitsuhisa; and Yoshihara, Hiroshi, 4,071,569, Cl. 260-621.00C.

Takase, Toshio: *See*—
Ishikawa, Riichi; and Takase, Toshio, 4,071,135, Cl. 198-324.000.

Takayama, Michio: *See*—
Koike, Shin'ichi; Hayashi, Seijiro; and Takayama, Michio, 4,071,827, Cl. 325-42.000.

Takemoto, Tadashi; Kakizaki, Fusayoshi; and Ariyoshi, Yasuo, to Ajinomoto Co., Inc. Method of removing formyl groups from N-formyl-amino acid and N-formyl-peptide esters having free carboxyl groups. 4,071,511, Cl. 260-112.50R.

Takenaka, Haruo; Okiyama, Toshiaki; and Kawamata, Toshio, to Fuji Photo Film Co., Ltd. Electrophotographic copying film. 4,071,362, Cl. 96-1.400.

Takenaka, Kiyoshi: *See*—
Yokogawa, Seiji; and Takenaka, Kiyoshi, 4,070,784, Cl. 43-17.500.

Taketomi, Bunsaku. Upper thread take-up levers for sewing machines. 4,070,976, Cl. 112-241.000.

Takeuchi, Hidesuke: *See*—
Kobayashi, Seizo; Hirayama, Toshiharu; Kamiya, Takeshi; Kezuka, Seiju; and Takeuchi, Hidesuke, 4,071,591, Cl. 264-45.300.

Takeuchi, Tomio: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Hamada, Masa; Takamatsu, Akira; and Oki, Toshikazu, 4,071,411, Cl. 195-80.00R.

Takita, Kiyoshi: *See*—
Hayashi, Eiichi; Takita, Kiyoshi; Sugiyama, Hironari; and Nezu, Yukio, 4,071,534, Cl. 260-343.700.

Talasz, Johann: *See*—
Schmeisser, Walter; and Talasz, Johann, 4,071,128, Cl. 192-133.000.

Talmage, John E.; and Bates, L. Dexter, to Elographics, Incorporated. Lucent electrographic sensor for determining planar coordinates. 4,071,689, Cl. 178-18.000.

Tamai, Yasuo: *See*—
Ogawa, Hiroshi; Ishii, Kazuhide; Nakamura, Matsuaki; Tamai, Yasuo; and Akashi, Goro, 4,071,654, Cl. 428-336.000.

Tamao, Yoshikuno: *See*—
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,071,621, Cl. 424-177.000.

Tamura, Mitsuhisa: *See*—
Yamahara, Takeshi; Takano, Tetsuo; Tamura, Mitsuhisa; and Yoshihara, Hiroshi, 4,071,569, Cl. 260-621.00C.

Tanaka, Hidehiko: *See*—
Soda, Kenji; Tanaka, Hidehiko; Nakazawa, Hidetsugu; and Mitsugi, Koji, 4,071,405, Cl. 195-29.000.

Tanaka, Hiroshi: *See*—
Marushima, Giichi; Tanaka, Hiroshi; Tosaka, Umi; Takahashi, Shinkichi; and Komiya, Takao, 4,071,361, Cl. 96-1.400.

Tanaka, Jinkichi; and Watanabe, Itaru, to Nippon Kokan Kabushiki

Kaisha. Method of large current gas shielded arc welding. 4,071,732, Cl. 219-137.00R.
Tanaka, Masahide: *See*—
Kashiwa, Norio; Fuji, Saburo; and Tanaka, Masahide, 4,071,674, Cl. 526-125.000.
Tanaka, Tsuneo: *See*—
Nagata, Seiichi; Tanaka, Tsuneo; and Fukai, Masakazu, 4,071,383, Cl. 148-175.000.
Tanenbaum, Stuart W.: *See*—
Flashner, Michael; and Tanenbaum, Stuart W., 4,071,408, Cl. 195-62.000.
Tashiro, Norio: *See*—
Koinuma, Tokuju; Yamamiya, Hideki; and Tashiro, Norio, 4,071,804, Cl. 315-39.710.
Tate, Mark T.: *See*—
Booher, Howard, 4,071,153, Cl. 214-82.000.
Tatehana, Yoshikazu: *See*—
Tokunaga, Hiroshi; Tatehana, Yoshikazu; and Umekawa, Akira, 4,071,228, Cl. 266-162.000.
Taylor, Kathleen C.: *See*—
Schlatter, James C.; and Taylor, Kathleen C., 4,071,600, Cl. 423-213.700.
Taylor, Patrick A.: *See*—
Lathrop, Francis O., Jr.; Jacobs, Edward H.; Wood, William E.; and Taylor, Patrick A., 4,071,862, Cl. 360-97.000.
Taylor, Raymond C.: *See*—
Richards, Frank P.; and Taylor, Raymond C., 4,070,953, Cl. 93-39.10R.
Tazuma, James J.; and Zadra, Mario D., to Goodyear Tire & Rubber Company, The. Metal salts of modified anhydride resin. 4,071,669, Cl. 526-47.300.
TBA Industrial Products Limited: *See*—
Huggett, Ralph, 4,070,816, Cl. 57-153.000.
Teijin Chemicals, Ltd.: *See*—
Watase, Hideo, 4,071,048, Cl. 138-145.000.
Teldix G.m.b.H.: *See*—
Quandt, Gerhard; Ries, Werner; and Richter, Joachim, 4,070,813, Cl. 57-58.890.
Telefonaktiebolaget L M Ericsson: *See*—
Leijonhufvud, Gosta Karl Knutsson; and Thyselius, Per-Olof, 4,071,701, Cl. 179-15.0AT.
Telesciences, Inc.: *See*—
Kaplan, Murray L.; Herbster, Terry N.; and Holden, Alan F., 4,071,708, Cl. 179-16.00E.
Templin, Raymond J.: *See*—
Pecka, Richard D.; and Templin, Raymond J., 4,071,218, Cl. 248-221.400.
Teraji, Tsutomu Toyonaka: *See*—
Kamiya, Takashi; Teraji, Tsutomu Toyonaka; Hashimoto, Masashi; Oku, Teruo Kyoto; Nakaguti, Osamu; Saito, Yoshihisa; and Nakamura, Hitoshi, 4,071,527, Cl. 260-306.500.
Terneau, Robert: *See*—
Jacquemin, Francis; Terneau, Robert; and Voiturier, Jean-Pierre, 4,071,649, Cl. 428-215.000.
Tessier, Claude R.: *See*—
Richard, Pierre D.; and Tessier, Claude R., 4,071,715, Cl. 179-90.00K.
Tetreault, Merritt D., to Amacoil Machinery, Inc. Apparatus for granulating material. 4,071,198, Cl. 241-73.000.
Tewksbury, Stuart Keene, to Bell Telephone Laboratories, Incorporated. Apparatus for analog to digital conversion. 4,071,842, Cl. 340-347.0AD.
Texaco Development Corporation: *See*—
Bentley, Floyd E., 4,071,558, Cl. 260-570.00D.
Texaco Inc.: *See*—
Allen, Joseph C., 4,071,458, Cl. 252-8.55D.
Arnold, Dan M.; and Paap, Hans J., 4,071,757, Cl. 250-265.000.
Patterson, John A., 4,071,476, Cl. 252-557.000.
Supernaw, Irwin R.; Arnold, Dan McCay; and Link, Arthur Jurgen, 4,071,755, Cl. 250-253.000.
Texas Instruments Incorporated: *See*—
Buss, Dennis D., 4,071,906, Cl. 364-819.000.
Hewes, Charles Robert, 4,071,775, Cl. 307-221.00D.
Kochem, Robert C., 4,071,871, Cl. 361-27.000.
Kochem, Robert C., 4,071,875, Cl. 361-113.000.
Santala, Teuvo J., 4,071,659, Cl. 428-677.000.
Textron Inc.: *See*—
DeCaro, Charles J., 4,070,889, Cl. 72-114.000.
Tezuka, Tohru: *See*—
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,071,621, Cl. 424-177.000.
Th. Goldschmidt AG: *See*—
Bade, Volkbert, 4,071,544, Cl. 260-410.700.
Domazer, Hans-Gunter; and Eggert, Horst, 4,071,229, Cl. 266-173.000.
Theobald, Hans: *See*—
Jung, Johann; Kiehs, Karl; Zeeh, Bernd; and Theobald, Hans, 4,071,551, Cl. 260-501.150.
Thermoguard Insulation Company: *See*—
Sanders, Duane, 4,070,853, Cl. 53-373.000.
Thien, Gerhard: *See*—
Skatsche, Othmar; Thien, Gerhard; and Fachbach, Heinz, 4,071,008, Cl. 123-198.00E.
Thomas & Betts Corporation: *See*—
Bauerkemper, Michael, 4,070,754, Cl. 29-749.000.
Thomas French and Sons (Electrical) Limited: *See*—
Makin, Ronay Denton, 4,070,911, Cl. 73-343.00R.
Thomas, John Ellwood: *See*—
Kuhns, Garrett D.; Astorp, Norman E.; Mullen, Richard V.; and Thomas, John Ellwood, 4,071,195, Cl. 239-289.000.
Thomas, John G.: *See*—
Walraven, Thomas A.; Thomas, John G.; and Hall, James B., 4,071,182, Cl. 228-110.000.
Thomas, John P.: *See*—
Guinn, David C.; Haggard, Archie K.; and Thomas, John P., 4,070,981, Cl. 114-293.000.
Guinn, David C.; Haggard, Archie K.; and Thomas, John P., 4,071,145, Cl. 211-60.00S.
Thomas, Norman W.; Berardinelli, Frank M.; and Edelman, Robert, to Celanese Corporation. Polycarbodiimide modification of polyesters for extrusion applications. 4,071,503, Cl. 260-75.00N.
Thomas, Robert W.: *See*—
McDaniel, John H.; Sinnard, Harry W.; and Thomas, Robert W., 4,070,940, Cl. 83-464.000.
Thomas, William Anthony: *See*—
Hassall, Cedric Herbert; Johnson, William Henry; Krohn, Antonin; Smithen, Carey Ernest; and Thomas, William Anthony, 4,071,525, Cl. 260-295.0AM.
Thompson, Douglas: *See*—
Thompson, Richard D.; Thompson, Douglas; and Beeley, Micheal G., 4,070,876, Cl. 68-3.00R.
Thompson, Garth Molesdale: *See*—
Dalton, Sally Elizabeth; Gingell, William George; Jenkins, David Conwil; King, Leslie George; Lee, Glyn Evan; and Thompson, Garth Molesdale, 4,071,528, Cl. 260-306.70T.
Thompson, Philip W. Lightweight-type detachable lock. 4,070,879, Cl. 70-20.000.
Thompson, Richard D.; Thompson, Douglas; and Beeley, Micheal G., to McGraw-Edison Company. Apparatus for vapor phase treating garments. 4,070,876, Cl. 68-3.00R.
Thompson, Walter F.; and Redo, Dennis M., to General Cable Corporation. Conductor supply system for communication cable making apparatus. 4,071,150, Cl. 214-16.40R.
Thomson-Brandt: *See*—
Bijon, Paul; Fichot, Bernard; and Lainez, Lucien, 4,071,854, Cl. 358-128.000.
Thomson-CSF: *See*—
Charransol, Pierre; Hauri, Jacques; and Fontana, Serge, 4,071,702, Cl. 179-15.0AT.
Marien, Jacques, 4,071,843, Cl. 343-5.0CD.
Thorneycroft, Malcolm: *See*—
Sladdin, Stuart Rodney; and Thorneycroft, Malcolm, 4,070,934, Cl. 82-2.00R.
Thuren, John B.; Datwyler, Walter F., Jr.; and Phipps, Jack R., to Bendix Corporation, The. Fuel control apparatus for dual chamber stratified charge engine systems. 4,071,013, Cl. 123-32.0SP.
Thurlow, Norman C., II, to Westinghouse Electric Corporation. Gamma and alpha compensated fission chamber. 4,071,764, Cl. 250-390.000.
Thyselius, Per-Olof: *See*—
Leijonhufvud, Gosta Karl Knutsson; and Thyselius, Per-Olof, 4,071,701, Cl. 179-15.0AT.
Tibbs, Lilburn E. Automatic pneumatic connector for air brakes and the like. 4,071,148, Cl. 213-76.000.
Tiefert, Karl H.: *See*—
Legat, Wilhelm H.; Taft, Keith G.; and Tiefert, Karl H., 4,070,748, Cl. 29-577.00C.
Tkach, Khaim Berkovich; Kostylev, Alexandr Dmitrievich; Tupitsyn, Konstantin Konstantinovich; Gurkov, Konstantin Stepanovich; Klimashko, Vladimir Vasilievich; Rozhkov, Leonid Georgievich; Bondar, Mikhail Jurievich; and Smolyanitsky, Boris Nikolaevich. Pneumatic impact devices. 4,070,948, Cl. 91-234.000.
Toa Nenryo Kogyo Kabushiki Kaisha: *See*—
Okamoto, Nobukazu, 4,071,548, Cl. 260-462.00R.
Tobe, Akihiro: *See*—
Kikumoto, Ryoji; Tobe, Akihiro; Tonomura, Shinji; Ikoma, Hidenobu; and Honda, Kazuo, 4,071,559, Cl. 260-570.700.
Todt, Enno, deceased: *See*—
Dotzer, Richard; Hauschildt, Hans-Georg; Todt, Enno, deceased; Todt, Susanne, heir; Todt, Ruth Katharina, heir; and Todt, Ernst Josef, heir, 4,071,526, Cl. 260-299.000.
Todt, Ernst Josef, heir: *See*—
Dotzer, Richard; Hauschildt, Hans-Georg; Todt, Enno, deceased; Todt, Susanne, heir; Todt, Ruth Katharina, heir; and Todt, Ernst Josef, heir, 4,071,526, Cl. 260-299.000.
Todt, Ruth Katharina, heir: *See*—
Dotzer, Richard; Hauschildt, Hans-Georg; Todt, Enno, deceased; Todt, Susanne, heir; Todt, Ruth Katharina, heir; and Todt, Ernst Josef, heir, 4,071,526, Cl. 260-299.000.
Todt, Susanne, heir: *See*—
Dotzer, Richard; Hauschildt, Hans-Georg; Todt, Enno, deceased; Todt, Susanne, heir; Todt, Ruth Katharina, heir; and Todt, Ernst Josef, heir, 4,071,526, Cl. 260-299.000.
Tokico Ltd.: *See*—
Nagase, Toshiro, 4,071,057, Cl. 141-4.000.
Yamada, Masami; and Soeda, Yuji, 4,070,895, Cl. 72-334.000.
Tokumaru, Yukuya; and Nakai, Masanori, to Tokyo Shibaura Electric Co., Ltd. Integrated injection logic with both fan in and fan out Schottky diodes, serially connected between stages. 4,071,774, Cl. 307-215.000.
Tokunaga, Hiroshi; Tatehana, Yoshikazu; and Umekawa, Akira, to

Mitsui Mining & Smelting Co., Ltd. Method of recovering valuable metals from zinc bearing materials and blast furnace relevant thereto. 4,071,228, Cl. 266-162.000.
Tokyo Institute of Technology: *See—*
Ikeda, Sakuji; and Soga, Kazuo, 4,071,667, Cl. 526-11.100.
Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Andow, Fumio; Yamaura, Mitsuru; and Kitagawa, Minoru, 4,071,873, Cl. 361-64.000.
Tokyo Shibaura Electric Co., Ltd.: *See—*
Koinuma, Tokuju; Yamamiya, Hideki; and Tashiro, Norio, 4,071,804, Cl. 315-39.710.
Takanashi, Yukio; Sato, Fumiyuki; and Shinpo, Masanori, 4,071,803, Cl. 313-409.000.
Tokumaru, Yukuya; and Nakai, Masanori, 4,071,774, Cl. 307-215.000.
Tolj, Henry D.: *See—*
Hopwood, Francis W.; Staley, Lester K.; and Tolj, Henry D., 4,071,844, Cl. 343-17.20R.
Tolochko, Alexei Ivanovich: *See—*
Zherdev, Anatoly Vasilievich; Yakimenko, Grigory Savvich; Gritsuk, Lev Dmitrievich; Gorbik, Anatoly Stepanovicy; Belkin, Evgeny Grigorievich; Tseluiko, Jury Ivanovich; Gorodetsky, Yakov Izrailievich; Severin, Vasily Fedorovich; and Tolochko, Alexei Ivanovich, 4,071,230, Cl. 266-193.000.
Tomiita, Kazuo: *See—*
Negishi, Takao; and Tomiita, Kazuo, 4,070,815, Cl. 57-140.00J.
Tomita, Shimpei: *See—*
Onoda, Takeru; and Tomita, Shimpei, 4,071,568, Cl. 260-615.00R.
Tomoyuki, Nogami, to Toyota Jidosha Kogyo Kabushiki Kaisha. Fluid pressure control device for crossed piping brake system. 4,071,281, Cl. 303-24.00A.
Tonomura, Shinji: *See—*
Kikumoto, Ryoji; Tobe, Akihiro; Tonomura, Shinji; Ikoma, Hidenobu; and Honda, Kazuo, 4,071,559, Cl. 260-570.700.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,071,621, Cl. 424-177.000.
Toray Industries, Inc.: *See—*
Negishi, Takao; and Tomiita, Kazuo, 4,070,815, Cl. 57-140.00J.
Torburn, Roy B.: *See—*
Benson, Wayne J.; Torburn, Roy B.; and Tweed, Donald G., 4,071,876, Cl. 361-119.000.
Tork, Inc.: *See—*
Balogh, Andre, 4,071,749, Cl. 362-20.000.
Tosaka, Umi: *See—*
Marushima, Giichi; Tanaka, Hiroshi; Tosaka, Umi; Takahashi, Shinkichi; and Komiya, Takao, 4,071,361, Cl. 96-1.400.
Towmotor Corporation: *See—*
Wible, John E., 4,070,857, Cl. 60-422.000.
Toyo Boseki Kabushiki Kaisha: *See—*
Sugiyama, Hiroshige; and Yasuda, Hiroshi, 4,071,502, Cl. 260-75.00T.
Toyo Seikan Kaisha Limited: *See—*
Miyamatsu, Yasunori; Yasumuro, Hisakazu; Miyata, Kenichi; Shimizu, Takashi; and Matsuoka, Kikuo, 4,070,885, Cl. 72-46.000.
Toyoda, Toshiaki: *See—*
Nishikubo, Michio; Miura, Sei; Toyoda, Toshiaki; Jonishi, Katsunori; and Yoneta, Kouichi, 4,070,893, Cl. 72-234.000.
Toyoshima, Kunihiko: *See—*
Watanabe, Hiroo; Toyoshima, Kunihiko; Noutomi, Masaru; and Yamakawa, Kouichi, 4,071,448, Cl. 210-50.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Goto, Kenji, 4,071,001, Cl. 123-75.00B.
Konishi, Masami; Nakamura, Norihiko; Itou, Takaaki; and Kikuchi, Kazuo, 4,071,585, Cl. 261-36.00A.
Tomoyuki, Nogami, 4,071,281, Cl. 303-24.00A.
Traut, Earl W. Integrated flow turbine engine. 4,070,824, Cl. 60-39.430.
Trayvou S.A.: *See—*
Rouban, Basile, 4,071,103, Cl. 177-188.000.
Trotter, George H. Arrow positioning device. 4,071,014, Cl. 124-41.00A.
Troxler, Franz: *See—*
Wiskott, Erik; and Troxler, Franz, 4,071,630, Cl. 424-256.000.
TRW, Inc.: *See—*
Moed, Johannes A. R., 4,071,704, Cl. 179-15.0BF.
Schaffter, Craig, 4,071,703, Cl. 179-15.0AQ.
Steinke, James Marion; and Gaskins, Justin, 4,071,132, Cl. 197-168.000.
Tsao, Utah, to Lummus Company, The. Control of molten salt oxidation in production of chlorinated hydrocarbons. 4,071,571, Cl. 260-654.00R.
Tseluiko, Jury Ivanovich: *See—*
Zherdev, Anatoly Vasilievich; Yakimenko, Grigory Savvich; Gritsuk, Lev Dmitrievich; Gorbik, Anatoly Stepanovicy; Belkin, Evgeny Grigorievich; Tseluiko, Jury Ivanovich; Gorodetsky, Yakov Izrailievich; Severin, Vasily Fedorovich; and Tolochko, Alexei Ivanovich, 4,071,230, Cl. 266-193.000.
Tuba, Zoltan; Marsai, Maria; Biro, Katalin; Szporny, Laszlo; Karpati, Egon; and Szeberenyi, Szabolcs, to Richter Gedeon Vegyeszeti Gyar Rt. Triamino-androstanes and a process for the preparation of the said compounds. 4,071,515, Cl. 260-239.500.
Tube Machinery Corporation: *See—*
Hankin, Ralph L., 4,070,887, Cl. 72-52.000.
Tums, Valdis M.; and Maxweil, Thomas J., to Union Carbide Corporation. Closure for shirred casing sticks. 4,070,729, Cl. 17-34.000.
Tupitsyn, Konstantin Konstantinovich: *See—*
Tksch, Khaim Berkovich; Kostylev, Alexandr Dmitrievich; Tupitsyn, Konstantin Konstantinovich; Gurkov, Konstantin Stepanovich; Klimashko, Vladimir Vasilievich; Rozhkov, Leonid Georgievich; Bondar, Mikhail Jurievich; and Smolyanitsky, Boris Nikolaevich, 4,070,948, Cl. 91-234.000.
Turek, Clarence W.; Aronson, Aaron B.; and Wittlock, Dale C., to Signode Corporation. Electronic control system. 4,071,131, Cl. 197-6.400.
Turkowski, Lukasz: *See—*
Ostrowski, Jerzy; Sierputowski, Piotr; Turkowski, Lukasz; Jablkiewicz, Jerzy; Pacholski, Jan; and Jedryka, Tadeusz, 4,070,812, Cl. 57-58.890.
Tutko, Albert John: *See—*
DeNigris, Ernest Gerard; and Tutko, Albert John, 4,071,290, Cl. 339-258.00F.
Tuzee, John. Car top ski and ski-gear carrier. 4,071,176, Cl. 224-42.10E.
Tweed, Donald G.: *See—*
Benson, Wayne J.; Torburn, Roy B.; and Tweed, Donald G., 4,071,876, Cl. 361-119.000.
Twin Disc, Incorporated: *See—*
Schneider, Raymond C.; and Pelligrino, Paul A., 4,070,926, Cl. 74-730.000.
Tyler, Lawson John: *See—*
Rupert, Gerald B.; and Tyler, Lawson John, 4,070,906, Cl. 73-88.00E.
Ueda, Atsushi: *See—*
Sumida, Shizuo; Nii, Kazuo; Shimizu, Osamu; Ueda, Atsushi; and Ishii, Mitsuaki, 4,071,889, Cl. 364-200.000.
Ueda, Takuya: *See—*
Nakagawa, Ryuichi; Yoshimatsu, Shiro; Ueda, Takuya; Fukuzawa, Akira; Ozaki, Tsuyoshi; Sato, Akira; and Mitsui, Tatsuro, 4,071,687, Cl. 13-10.000.
UMC Industries, Inc.: *See—*
Frattarola, Joseph R.; and Ford, Peter W., 4,071,741, Cl. 235-436.000.
Umekawa, Akira: *See—*
Tokunaga, Hiroshi; Tatehana, Yoshikazu; and Umekawa, Akira, 4,071,228, Cl. 266-162.000.
Umezawa, Hamao; Takeuchi, Tomio; Hamada, Masa; Takamatsu, Akira; and Oki, Toshikazu, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. Antitumor antibiotics aclacinomycins A and B [RD-9187A]. 4,071,411, Cl. 195-80.00R.
Umezawa, Kazumi: *See—*
Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, 4,071,295, Cl. 355-3.0SH.
Ummen, Arnulf; and Muller, Alexander, to Arntz-Optibelt-KG. Belt drive system. 4,070,919, Cl. 74-229.000.
Uni-Cardan AG: *See—*
Krude, Werner, 4,070,872, Cl. 64-21.000.
Union Carbide Corporation: *See—*
Durden, John Apling, Jr., 4,071,627, Cl. 424-246.000.
Lambrecht, Richard Arthur, 4,070,747, Cl. 29-570.000.
Litteral, Carl James; and Mullins, David Lee, 4,071,483, Cl. 260-2.5AH.
Tums, Valdis M.; and Maxwell, Thomas J., 4,070,729, Cl. 17-34.000.
Uniroyal, Inc.: *See—*
Freda, George B., 4,071,326, Cl. 44-7.00E.
Freda, George B., 4,071,488, Cl. 260-23.70A.
United Kingdom of Great Britain and Northern Ireland, The Secretary of Defence, in Her Brittanic Majesty's Government of the: *See—*
Bird, Jack Raymond, 4,071,372, Cl. 106-73.500.
U.S. Blind Stitch Machine Corporation: *See—*
Russell, Richard, 4,070,975, Cl. 112-135.000.
United States of America
Agriculture: *See—*
Pepperman, Armand B., Jr.; Daigle, Donald J.; and Vail, Sidney L., 4,071,501, Cl. 260-67.00R.
Air Force: *See—*
Setrin, Morton, 4,071,828, Cl. 325-65.000.
Zapala, Raymond J., 4,071,864, Cl. 360-103.000.
Army: *See—*
Carts, Stanley L., Jr., 4,070,763, Cl. 33-241.000.
De Santis, Charles M., 4,071,819, Cl. 324-58.00B.
Gisser, Henry; and Portnoy, Seymour, 4,071,678, Cl. 526-328.000.
Hanson, Charles M., 4,070,860, Cl. 60-616.000.
Hartz, Lewis C., Jr., 4,070,744, Cl. 29-241.000.
Energy: *See—*
Farber, Gerald, 4,071,151, Cl. 214-35.00R.
Upton, Richard G., 4,071,743, Cl. 235-92.0CV.
Health, Education and Welfare: *See—*
Goodenough, David J., 4,071,768, Cl. 250-444.000.
Interior: *See—*
Atkinson, Gary B.; and Nicks, Larry J., 4,071,473, Cl. 252-462.000.
Rupert, Gerald B.; and Tyler, Lawson John, 4,070,906, Cl. 73-88.00E.
Navy: *See—*
Casasent, David Paul, 4,071,907, Cl. 364-822.000.
Eckert, Terry T.; and McDonough, Edward C., 4,071,194, Cl. 239-127.300.
Miller, Ralph H., Jr.; Dyer, William W.; Waterbury, John A.; Carlson, Wayland A.; and Eastman, Richard O., 4,071,705, Cl. 179-15.0BA.

Miller, Ralph H., Jr.; Dyer, William W.; Waterbury, John A.; Carlson, Wayland A.; and Eastman, Richard O., 4,071,826, Cl. 325-39.000.

U.S. Philips Corporation: *See*—
Bretschneider, Hermann; Hueber, Herman Pieter; and Louzil, Friedrich, 4,071,716, Cl. 179-100.1DR.
Greve, Reinhard Cornelis; and van Luijk, Cornelis Pieter, 4,071,728, Cl. 200-175.000.
Peschmann, Kristian, 4,071,763, Cl. 250-374.000.
van Dijk, Jan; Claassen, Volkert; and Zwagemakers, Johannes Maria Antonius, 4,071,686, Cl. 560-35.000.
van Oostrum, Karel Jan; and van Gorkom, Gerardus Gegorius Petrus, 4,071,765, Cl. 250-397.000.

United Technologies Corporation: *See*—
Sederquist, Richard A., 4,071,330, Cl. 48-94.000.

United Turbine AB & Co.: *See*—
Kronogard, Sven-Olof, 4,070,825, Cl. 60-39.51R.

University of Alabama, The Board of Trustees of the: *See*—
Hall, Leo M., 4,071,407, Cl. 195-62.000.

University of Missouri, Curators of the: *See*—
Cheng, Kuang Lu; and Chao, Eric En-Kuang, 4,071,427, Cl. 204-195.00M.

UOP Inc.: *See*—
Lynch, Jerome G.; and Quigley, William A., 4,071,688, Cl. 174-138.00R.

Upton, Richard G., to United States of America, Energy. Digital scale converter. 4,071,743, Cl. 235-92.0CV.

Uraneck, Carl A.; Burleigh, John E.; and Solomon, Paul W., to Phillips Petroleum Company. Emulsion polymerized copolymers of 2,4-pentadien-1-ol. 4,071,679, Cl. 526-338.000.

Usagawa, Yasushi; Yamashita, Kiyoshi; Nakatani, Mamoru; Masuda, Kosaku; and Kawakatsu, Satoshi, to Mitsubishi Paper Mills, Ltd. Silver halide emulsion containing two-equivalent yellow dye-forming coupler. 4,071,365, Cl. 96-56.500.

Usher, Eric S.: *See*—
Weir, Donald A.; Usher, Eric S.; and Howells, George A., 4,071,692, Cl. 178-68.000.

Usui, Kuniharu; Shimba, Hiroshi; Nakagaki, Kunihiro; and Mukunashi, Hiroaki, to Sumitomo Electric Industries, Ltd.; and Usui, Kuniharu. Impulse heat joining of wrapping tapes for wire cables. 4,071,388, Cl. 156-157.000.

v. d. Marwitz, Hans-Gunther, to Bayerische Motoren Werke Aktiengesellschaft. Clear window for protective helmets. 4,070,712, Cl. 2-10.000.

V.G.S. G.m.b.H.: *See*—
Kuhn, Johannes, 4,070,838, Cl. 52-400.000.

Vacsol Corporation: *See*—
O'Blasny, Richard H., 4,071,438, Cl. 208-180.000.

Vail, Sidney L.: *See*—
Pepperman, Armand B., Jr.; Daigle, Donald J.; and Vail, Sidney L., 4,071,501, Cl. 260-67.00R.

Valls, Conrado. Machine for continuously processing textile fabrics. 4,070,878, Cl. 68-22.00R.

Van Bennekom, Carl F.: *See*—
Kernander, Warren N.; and Van Bennekom, Carl F., 4,071,824, Cl. 324-127.000.

Van Buskirk, Oral R.: *See*—
Doerner, William Allen; and Van Buskirk, Oral R., 4,070,862, Cl. 60-655.000.

VanderLans, Gerald G. Pipeline joint tester. 4,070,904, Cl. 73-40.50R.

van der Lely, Cornelis. Buildings erected from three or more box-shaped sections, and methods of fabricating such buildings. 4,070,804, Cl. 52-64.000.

van der Lely, Cornelis. Soil cultivating implements. 4,071,089, Cl. 172-59.000.

van der Vies, Johannes, to Akzona Incorporated. Pharmaceutical preparation adapted for oral administration. 4,071,623, Cl. 424-238.000.

van Dijk, Jan; Claassen, Volkert; and Zwagemakers, Johannes Maria Antonius, to U.S. Philips Corporation. Novel benzylidene aminooxyalkyl carboxylic acids and carboxylic acid derivatives. 4,071,686, Cl. 560-35.000.

Vanfleet, Charles R.; and Ruehr, William C., to General Electric Company. Method and apparatus for limiting ingestion of debris into the inlet of a gas turbine engine. 4,070,827, Cl. 60-204.000.

van Gorkom, Gerardus Gegorius Petrus: *See*—
van Oostrum, Karel Jan; and van Gorkom, Gerardus Gegorius Petrus, 4,071,765, Cl. 250-397.000.

Vanhaiden, Peter: *See*—
Stark, Ernst-Joachim; Vanhaiden, Peter; and Klinkenberg, Herbert, 4,071,495, Cl. 260-42.180.

Van House, Robert M., to General Motors Corporation. Master and slave break boosters for front and rear wheel brakes with wheel lock control. 4,071,283, Cl. 303-114.000.

VanHulle, Glenn J.: *See*—
Lindl, Willibald M.; Klande, James R.; and VanHulle, Glenn J., 4,071,635, Cl. 426-264.000.

van Luijk, Cornelis Pieter: *See*—
Greve, Reinhard Cornelis; and van Luijk, Cornelis Pieter, 4,071,728, Cl. 200-175.000.

van Oostrum, Karel Jan; and van Gorkom, Gerardus Gegorius Petrus, to U.S. Philips Corporation. Electron microscope. 4,071,765, Cl. 250-397.000.

Van Ostenbridge, Ron; and Sturgeon, Michael E., to K-Tron Corporation. Auto zero circuit. 4,071,102, Cl. 177-165.000.

Vanzo, Edward; and Smith, Lewis S., to Xerox Corporation. Method of sizing monomer droplets for suspension polymerization to form small particles. 4,071,670, Cl. 526-88.000.

Vapor Corporation: *See*—
Callahan, Bernard E.; and Christianson, Edward A., 4,071,282, Cl. 303-106.000.

Vargo, Donald L.: *See*—
Hopkins, Henry S., Jr.; and Vargo, Donald L., 4,071,482, Cl. 260-2.5AJ.

Vasallo, Sergio A. Desk ornament. 4,070,782, Cl. 40-323.000.

VASE Aktiengesellschaft: *See*—
Jung, Johann; Kiehs, Karl; Zeeh, Bernd; and Theobald, Hans, 4,071,551, Cl. 260-501.150.

Vasek, Vitezslav; Koblizek, Pavel; and Prazak, Karel, to Vyzkumny ustav bavlnarsky. Rotary reed having facilities for adjustably separating groups of leno warp threads. 4,071,052, Cl. 139-436.000.

VCA Corporation: *See*—
Burke, James E.; and Grzesiak, Anthony J., 4,071,196, Cl. 239-492.000.
Horan, Paul F., 4,071,173, Cl. 222-321.000.

Veeder Industries, Inc.: *See*—
Fleischer, Donald Whiting, 4,071,742, Cl. 235-92.0FL.

Vello, Francesco, to Red Wing Shoe Company, Inc. Insole for rock climbing shoe. 4,070,770, Cl. 36-43.000.

Venalainen, Teuvo Olavi. Metal deforming apparatus for purposes such as automobile repairs. 4,070,899, Cl. 72-457.000.

Venkatesan, Thirumalai Nallan Chakravarthy: *See*—
Gibbs, Hyatt McDonald; McCall, Samuel Leverte, Jr.; and Venkatesan, Thirumalai Nallan Chakravarthy, 4,071,831, Cl. 330-4.300.

Venuto, Paul B.: *See*—
Owen, Hartley; and Venuto, Paul B., 4,071,573, Cl. 260-668.00R.

Vepa Aktiengesellschaft: *See*—
Fleissner, Hans, 4,070,877, Cl. 68-5.00D.

Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft: *See*—
Kunz, Helmut; and Kofler, Roland, 4,070,883, Cl. 72-14.000.

Vertegaal, Jacobus Gerardus, to Stork Amsterdam B.V. Thin flexible metal squeegee blade for rotary screen printer. 4,070,964, Cl. 101-120.000.

Vick, Carl J., to Keg-Tainer, Inc. Insulated beer keg container. 4,071,160, Cl. 220-5.00R.

Vidovic, Nikola, to International Video Corporation. Phaseless equalizer. 4,071,782, Cl. 307-268.000.

Vijayendran, Bheema Rao: *See*—
Brana, George; and Vijayendran, Bheema Rao, 4,071,655, Cl. 428-403.000.

Vilyus, Robert P.: *See*—
Dunkerley, Fred J.; Gaudino, Albert J.; and Vilyus, Robert P., 4,071,381, Cl. 148-36.000.

Vinals, Joaquin Francisco; Kiwala, Jacob; Hruza, Denis E., Sr.; Hall, John B.; and Vock, Manfred Hugo, to International Flavors & Fragrances Inc. 2-Alkyl-4-phenyl-dihydropyrans and processes for augmenting the organoleptic properties of tobacco using one or more of said pyrans. 4,071,034, Cl. 131-17.00R.

Vinals, Joaquin Francisco; Kiwala, Jacob; Hruza, Denis E., Sr.; Hall, John B.; and Vock, Manfred Hugo, to International Flavors & Fragrances Inc. 2-Alkyl-4-phenyl-dihydropyrans and processes for augmenting the organoleptic properties of foodstuffs and tobacco using one or more of said pyrans. 4,071,535, Cl. 260-345.100.

Vincent, David N.; and Chang, Cheng Hsiung, to Champion International Corporation. Solvent composition for use in carbonless copy systems. 4,071,469, Cl. 252-364.000.

Vinci, Michele: *See*—
Di Sciascio, Nicola; and Vinci, Michele, 4,071,221, Cl. 251-228.000.

Virgilio, Del P. Floating apparatus for weeding and dredging waterways. 4,070,978, Cl. 114-26.000.

Vock, Manfred Hugo: *See*—
Vinals, Joaquin Francisco; Kiwala, Jacob; Hruza, Denis E., Sr.; Hall, John B.; and Vock, Manfred Hugo, 4,071,034, Cl. 131-17.00R.
Vinals, Joaquin Francisco; Kiwala, Jacob; Hruza, Denis E., Sr.; Hall, John B.; and Vock, Manfred Hugo, 4,071,535, Cl. 260-345.100.

Vodoklys, Frank M., to Westinghouse Electric Corporation. Deep-red emitting phosphor. 4,071,465, Cl. 252-301.40F.

Voiturier, Jean-Pierre: *See*—
Jacquemin, Francis; Terneau, Robert; and Voiturier, Jean-Pierre, 4,071,649, Cl. 428-215.000.

Volgyesy, Ivan L.: *See*—
Robinson, Richard L.; and Volgyesy, Ivan L., 4,071,159, Cl. 220-3.200.

von Allworden, Wilhelm, to Jean Walterscheid GmbH. Coupling device for a power transmission shaft. 4,071,105, Cl. 180-14.00R.

von Koch, Arwed, to Daimler-Benz Aktiengesellschaft. Control valve for the working pressure of an automatic change-speed gear. 4,070,928, Cl. 74-863.000.

Voss, William Baker. Dual-output bridge for bidirectional control. 4,071,814, Cl. 323-75.00B.

Vossnacke, Jurgen: *See*—
Ermel, Heinrich; Fruth, Franz; Fryda, Georg; Lang, Peter; Rau, Fritz; and Vossnacke, Jurgen, 4,071,296, Cl. 355-15.000.

Vroome, Ray L. Golf practice drive analyzer. 4,071,250, Cl. 273-185.00C.

Vuyovich, John M. Game device for launching and pushing a rolling wheel. 4,070,792, Cl. 46-220.000.

Vyzkumny ustav bavlnarsky: *See—*
Vasek, Vitezslav; Koblizek, Pavel; and Prazak, Karel, 4,071,052, Cl. 139-436.000.

W. Canning & Company, Ltd.: *See—*
James, Barrie Sydney, 4,071,418, Cl. 204-55.00R.
James, Barrie Sydney, 4,071,419, Cl. 204-55.00R.

Wacker-Chemitronic Gesellshaft fur Elektronic Grundstoffe mbH: *See—*
Griesshammer, Rudolf; Kirschner, Helmut; and Lechner, Gunther, 4,070,797, Cl. 51-326.000.

Waddill, John W.: *See—*
Huffman, Charles E.; McGuire, Robert J.; and Waddill, John W., 4,071,700, Cl. 179-15.0BF.

Wade, Elman E., to Westinghouse Electric Corporation. Nuclear reactor apparatus. 4,071,402, Cl. 176-27.000.

Wagenhals, Bruce: *See—*
Bishton, Norris J., Jr.; Rod, Robert L.; Wagenhals, Bruce; Woltanski, Theodore M.; and Blick, John S., III, 4,070,714, Cl. 4-318.000.

Wagenknecht, John H.; and Laurin, Dean G., to Monsanto Company. Electrolytic flow-cell apparatus and process for effecting sequential electrochemical reaction. 4,071,429, Cl. 204-231.000.

Wagner, Arthur F.: *See—*
Shen, Tsung-Ying; and Wagner, Arthur F., 4,071,478, Cl. 260-2.00R.

Wagner, Wolfram: *See—*
Bueb, Michael; Kubitzek, Harry; Langhans, Arthur; Rellensmann, Wolfgang; and Wagner, Wolfram, 4,070,817, Cl. 57-157.0TS.

Wagnon, Van C. Anti-rattle bicycle beverage container holder. 4,071,175, Cl. 224-36.000.

Waksberg, Armand, to RCA Limited. Automatic optical bias control for light modulators. 4,071,751, Cl. 250-201.000.

Walker, Grant W., to Energy Absorption Systems, Inc. Tubular member and process of forming a tubular member. 4,071,599, Cl. 264-311.000.

Walker, Loren H., to General Electric Company. AC Inverter with constant power output. 4,071,812, Cl. 363-80.000.

Walker-Neer Mfg. Co., Inc.: *See—*
Ford, George Alan, 4,071,101, Cl. 175-325.000.

Walker, Philip A.: *See—*
Niklas, Ludwig; and Walker, Philip A., 4,070,917, Cl. 73-598.000.

Walkup, Norris W.: *See—*
Platz, Gerald M.; and Walkup, Norris W., 4,071,325, Cl. 23-290.000.

Wallace, Mabel D. Mobile under-bed storage container. 4,071,258, Cl. 280-79.200.

Wallace, Thomas J. Threaded mechanical joint wall sleeve. 4,071,265, Cl. 285-158.000.

Wallace, William K., to Chicago Pneumatic Tool Company. Pneumatic screwdriver with torque responsive shut-off. 4,071,092, Cl. 173-12.000.

Walraven, Thomas A.; Thomas, John G.; and Hall, James B., to Christiana Metals Corporation. Method of making container with easy open top. 4,071,182, Cl. 228-110.000.

Warren, Charles Stewart, to RCA Corporation. Data packets distribution loop. 4,071,706, Cl. 179-15.0AL.

Watanabe, Hiroo; Toyoshima, Kunihiko; Noutomi, Masaru; and Yamakawa, Kouichi, to Mitsui Toatsu Chemicals, Incorporated. Method for treatment of cyanide-containing waste water. 4,071,448, Cl. 210-50.000.

Watanabe, Hiroshi: *See—*
Iijima, Eiji; Watanabe, Hiroshi; and Hayashi, Shizuo, 4,071,475, Cl. 252-545.000.

Watanabe, Itaru: *See—*
Tanaka, Jinkichi; and Watanabe, Itaru, 4,071,732, Cl. 219-137.00R.

Watanabe, Kaoru; and Nakayama, Syogo, to Matsushita Electrical Industrial Co., Ltd. Cassette tape recorder. 4,071,860, Cl. 360-96.000.

Watanabe, Yoshinori, to Mutoh Industry Ltd. Straightedge supporting device for rail type drawing instrument. 4,070,758, Cl. 33-76.00R.

Watase, Hideo, to Teijin Chemicals, Ltd. Coated hollow metal tubes and process for producing coated hollow metal tubes processed by bending, pressing or punching. 4,071,048, Cl. 138-145.000.

Waterbury, John A.: *See—*
Miller, Ralph H., Jr.; Dyer, William W.; Waterbury, John A.; Carlson, Wayland A.; and Eastman, Richard O., 4,071,705, Cl. 179-15.0BA.
Miller, Ralph H., Jr.; Dyer, William W.; Waterbury, John A.; Carlson, Wayland A.; and Eastman, Richard O., 4,071,826, Cl. 325-39.000.

Watson, Richard D.: *See—*
Martin, Ronald A.; Ashton, Charles R.; and Watson, Richard D., 4,071,788, Cl. 310-42.000.

Weaver, John H., to Anadex, Inc. Impact line printer. 4,070,963, Cl. 101-93.290.

Webber, Susan Anne: *See—*
Flanagan, James Loton; and Webber, Susan Anne, 4,071,695, Cl. 179-1.0VL.

Wehrmeister, Herbert Louis, to IMC Chemical Group, Inc. Method for preparing carbostyril derivatives. 4,071,520, Cl. 260-287.00K.

Weiner Geratebau - Stahlmobel, Firma: *See—*
Weiner, Rudolf, 4,071,174, Cl. 224-29.00M.

Weiner, Rudolf, to Weiner Geratebau - Stahlmobel, Firma. Map holder for automotive vehicle. 4,071,174, Cl. 224-29.00M.

Weir, Donald A.; Usher, Eric S.; and Howells, George A., to International Standard Electric Corporation. Data transmission systems. 4,071,692, Cl. 178-68.000.

Weisang, Joseph Edouard: *See—*
Engelhard, Philippe; Weisang, Joseph Edouard; and Paris, Guy, 4,071,437, Cl. 208-137.000.

Weiss, Jean Michel; and Irissou, Pierre-Regis Marie. Apparatus for synthesizing of colors. 4,071,809, Cl. 315-312.000.

Weisser, Eugene P.; Osan, G. Alan; and Mailki, Edward P., to ARCO Polymers, Inc. Monitoring suspension stability. 4,071,816, Cl. 324-30.00B.

Welkowsky, Murray Samuel, to Xonics, Inc. Electron radiograph receptor. 4,071,648, Cl. 428-212.000.

Werda, Konrad, to Lucas Electrical Company, Limited. Electrical switch having actuator light transmissive region, intermediate lens and light source. 4,071,726, Cl. 200-311.000.

Werner, Alfons; Roth, Mario; Siemonsen, Hans-Peter; and Winandi, Johann, to Saint-Gobain Industries. Apparatus for press bending window glass. 4,071,345, Cl. 65-273.000.

Werner, Gerhard; Grafe, Peter; Sattelmeyer, Richard; and Schmelzer, Heinz, to Hoechst Aktiengesellschaft. Hydrocarbon resins. 4,071,676, Cl. 526-283.000.

West, Bernard J.: *See—*
Lautner, Max E.; and West, Bernard J., 4,071,787, Cl. 310-42.000.

West Company, The: *See—*
Lowe, Allen D., 4,071,156, Cl. 215-224.000.

Western Electric Company, Inc.: *See—*
Broyde, Barret; Delles, Judith Archer; and North, Steven Forrest, 4,071,479, Cl. 260-2.300.
DeNigris, Ernest Gerard; and Tutko, Albert John, 4,071,290, Cl. 339-258.00F.

Westinghouse Electric Corporation: *See—*
Andrews, Harry N.; and Roman, Walter G., 4,071,403, Cl. 176-50.000.
Evans, George S.; and Skwirut, Henry, 4,071,288, Cl. 316-19.000.
Fey, Maurice G.; Wolf, Charles B.; Martin, Paul E.; and Harvey, Francis J., II, 4,071,588, Cl. 264-15.000.
Groves, Charles L., Jr.; and Johnson, Steven J., 4,071,897, Cl. 364-494.000.
Hopwood, Francis W.; Staley, Lester K.; and Tolj, Henry D., 4,071,844, Cl. 343-17.20R.
List, William F., 4,071,806, Cl. 315-150.000.
Raimondi, Albert A.; Kaufman, Howard N.; and Wood, Norman J., 4,071,254, Cl. 277-3.000.
Thurlow, Norman C., II, 4,071,764, Cl. 250-390.000.
Vodoklys, Frank M., 4,071,465, Cl. 252-301.40F.
Wade, Elman E., 4,071,402, Cl. 176-27.000.
Wood, Kenneth E.; and O'Farrell, James T., 4,071,895, Cl. 364-449.000.
Yamasaki, George K., 4,071,802, Cl. 313-209.000.

Westran Corporation: *See—*
Dalton, Thomas B.; Pyatt, Theodore Wayne; and Oosterhouse, Michael Jay, 4,071,274, Cl. 296-35.00A.

Westvaco Corporation: *See—*
Chaudhuri, Partha S., 4,071,392, Cl. 156-351.000.

Weyer, Horst; Muhlhaus, Ludwig; and Oberschachtsiek, Gerhard, to Friedrich Uhde GmbH. Process for the incineration of contaminated salt-bearing solutions. 4,071,612, Cl. 423-659.000.

WGW Westdeutsche Getriebe und Kupplungswerke GmbH: *See—*
Benthake, Heinrich, 4,070,923, Cl. 74-665.00P.

Wheelabrator-Frye Inc.: *See—*
Pedersen, John A., 4,070,799, Cl. 51-426.000.

White, Derek Graham Walter: *See—*
Hicklin, Denis Raymond; White, Derek Graham Walter; and Attwood, Brian William, 4,071,651, Cl. 428-284.000.

White, Robert W.: *See—*
Junck, John A.; Dezelan, Joseph A.; Larson, Donald J.; and White, Robert W., 4,071,106, Cl. 180-44.00F.

Whitney, James C.; Sander, Willy M.; and Debaudringhien, Andre T., to Dictaphone Corporation. Cassette changer apparatus. 4,071,857, Cl. 360-92.000.

Whittaker Corporation: *See—*
Lasher, Edward A., 4,071,578, Cl. 260-850.000.

Wible, John E., to Towmotor Corporation. Hydraulic priority circuit. 4,070,857, Cl. 60-422.000.

Wibom, Gustaf Hakan Oscar. Method of making holes of selected external configuration in preferably rock or ground formation, and a drilling machine for carrying out the method. 4,071,100, Cl. 175-69.000.

Wiedemann, Otto: *See—*
Gersch, Josef; and Wiedemann, Otto, 4,071,202, Cl. 242-71.100.

Wiermanski, Jerome J.: *See—*
Staats, Henry N.; and Wiermanski, Jerome J., 4,070,774, Cl. 40-2.200.

Wieschel, John E., to Harnischfeger Corporation. Spooling drum including stepped flanges. 4,071,205, Cl. 242-117.000.

Wiesen, Ernest J.: *See—*
Lange, Kai; Wiesen, Ernest J.; and Woronowicz, Eric M., 4,071,762, Cl. 250-369.000.

Wiesman, Dale C., to American Can Company. Adhesive formulation containing isobutylene rubber. 4,071,491, Cl. 260-28.50B.

Wilcox, Philip G.: *See—*
Ash, Stephen R.; Wilcox, Philip G.; and Kessler, David P., 4,071,444, Cl. 210-22.00A.

Williams, Kenneth Anthony. Method of grouting offshore structure. 4,070,869, Cl. 61-100.000.

Williams, Rodney E., to Moore Business Forms, Inc. High solids con-

tent active clay coating formulations and methods for producing and applying the same. 4,071,646, Cl. 427-358.000.
Williams, Thomas Alan, to Albright & Wilson Limited. Process for preparing phosphoric acid. 4,071,603, Cl. 423-320.000.
Williams, Thomas Walter: *See*—
Eichelberger, Edward Baxter; and Williams, Thomas Walter, 4,071,902, Cl. 364-716.000.
Willyard, James C. Cylinder-driven marine propulsion system. 4,070,982, Cl. 115-16.000.
Wilmer, Michael E., to Xerox Corporation. Encoder and decoder for bandwidth compression. 4,071,855, Cl. 358-260.000.
Wilson, Glenn R., to Monsanto Company. Process for the preparation of bis-(beta-cyanoethyl) alkyl phosphine from tris-cyanoethyl phosphine. 4,071,549, Cl. 260-465.80R.
Wilson Greatbatch Ltd.: *See*—
Mead, Ralph T.; Greatbatch, Wilson; and Rudolph, Frank W., 4,071,662, Cl. 429-178.000.
Wilton, Inga Elna Maria; Envall, Lennart Olof Gunnemar; Sundstroem, Kurt Lage; and Moran, David Patrick Joseph, to Lever Brothers Company. Proteinaceous low fat spread. 4,071,634, Cl. 426-604.000.
Winandi, Johann: *See*—
Werner, Alfons; Roth, Mario; Siemonsen, Hans-Peter; and Winandi, Johann, 4,071,345, Cl. 65-273.000.
Winchell, Frank J., to General Motors Corporation. Lock bar for cambering vehicle. 4,071,261, Cl. 280-220.000.
Wirth, Ernst: *See*—
Bloch, Heinz; and Wirth, Ernst, 4,071,870, Cl. 361-21.000.
Wiskott, Erik; and Troxler, Franz, to Sandoz Ltd. 1-Substituted-amino-3-(4-furo[3,2-c]pyridinyloxy)-2-propanols. 4,071,630, Cl. 424-256.000.
Wismer, Marco: *See*—
Bosso, Joseph F.; and Wismer, Marco, 4,071,428, Cl. 204-181.00C.
Wittlock, Dale C.: *See*—
Turek, Clarence W.; Aronson, Aaron B.; and Wittlock, Dale C., 4,071,131, Cl. 197-6.400.
Wojtowicz, John A., to Olin Corporation. Process for the production of dibasic magnesium hypochlorite. 4,071,605, Cl. 423-462.000.
Wolf, Charles B.: *See*—
Fey, Maurice G.; Wolf, Charles B.; Martin, Paul E.; and Harvey, Francis J., II, 4,071,588, Cl. 264-15.000.
Wolfe, Richard B.: *See*—
Evans, Joseph H.; and Wolfe, Richard B., 4,070,746, Cl. 29-450.000.
Wolfe, Saul, to Queen's University at Kingston. Preparation of 1-oxapenicillins and intermediates therefor. 4,071,512, Cl. 260-239.00A.
Woltanski, Theodore M.: *See*—
Bishton, Norris J., Jr.; Rod, Robert L.; Wagenhals, Bruce; Woltanski, Theodore M.; and Blick, John S., III, 4,070,714, Cl. 4-318.000.
Wong, Jack Yea. Method of electroplating aluminum and its alloys. 4,071,415, Cl. 204-14.00N.
Wood, Donald W., to Argus Chemical Corporation. Polymerization of ethylenically unsaturated monomers employing alpha-halo substituted diacyl peroxides. 4,071,677, Cl. 526-231.000.
Wood, Kenneth E.; and O'Farrell, James T., to Westinghouse Electric Corporation. Navigational display system. 4,071,895, Cl. 364-449.000.
Wood, Norman E., to French Co., The. Liquid filtration system. 4,071,451, Cl. 210-79.000.
Wood, Norman J.: *See*—
Raimondi, Albert A.; Kaufman, Howard N.; and Wood, Norman J., 4,071,254, Cl. 277-3.000.
Wood, William E.: *See*—
Lathrop, Francis O., Jr.; Jacobs, Edward H.; Wood, William E.; and Taylor, Patrick A., 4,071,862, Cl. 360-97.000.
Woodward, Cyril H. T. Apparatus and method for aerating, vibrating and aligning sheets of paper and the like. 4,070,767, Cl. 34-33.000.
Woronowicz, Eric M.: *See*—
Lange, Kai; Wiesen, Ernest J.; and Woronowicz, Eric M., 4,071,762, Cl. 250-369.000.
Wright, George C.: *See*—
Butterfield, James L.; and Wright, George C., 4,071,632, Cl. 424-263.000.
Wright, Herbert J. Cotton bale cover. 4,071,138, Cl. 206-83.500.
Wright, Howard Stanley. Lifting platform. 4,071,222, Cl. 254-8.00C.
Wright, John H., to General Electric Company. Silicone composition for analyzing blood samples. 4,071,316, Cl. 23-230.00B.
Wright, Michael R.: *See*—
Pernicano, Vincent S.; and Wright, Michael R., 4,071,139, Cl. 206-216.000.
Wunsch, Gerd: *See*—
Koester, Eberhard; Wunsch, Gerd; Schoenafinger, Eduard; and Schneehage, Hans Henning, 4,071,610, Cl. 423-634.000.
Wyman, Howard John, to Chrysler United Kingdom Limited. Rotor balancing devices. 4,070,922, Cl. 74-573.00R.
Wysong & Miles Company: *See*—
Heitner, Raymond J., 4,070,896, Cl. 72-389.000.
Xerox Corporation: *See*—
Geller, Stephen I., 4,071,909, Cl. 364-900.000.
Hammond, Thomas J., 4,071,798, Cl. 313-18.000.
Hammond, Thomas J.; and Lama, William L., 4,071,799, Cl. 313-44.000.
Holman, Robert L., 4,071,323, Cl. 23-273.00R.
Holman, Robert L., 4,071,396, Cl. 156-612.000.
Jones, Robert N., 4,071,363, Cl. 96-1.50R.
Matin, Fereidoon, 4,071,874, Cl. 361-94.000.
Moser, Rabin, 4,071,735, Cl. 219-216.000.
Roulund, Poul B., 4,071,754, Cl. 250-227.000.
Vanzo, Edward; and Smith, Lewis S., 4,071,670, Cl. 526-88.000.
Wilmer, Michael E., 4,071,855, Cl. 358-260.000.
Xienta, Inc.: *See*—
Pugliese, Peter, 4,071,020, Cl. 128-2.00A.
Xonics, Inc.: *See*—
Welkowsky, Murray Samuel, 4,071,648, Cl. 428-212.000.
Yakimenko, Grigory Savvich: *See*—
Zherdev, Anatoly Vasilievich; Yakimenko, Grigory Savvich; Gritsuk, Lev Dmitrievich; Gorbik, Anatoly Stepanovicy; Belkin, Evgeny Grigorievich; Tseluiko, Jury Ivanovich; Gorodetsky, Yakov Izrailievich; Severin, Vasily Fedorovich; and Tolochko, Alexei Ivanovich, 4,071,230, Cl. 266-193.000.
Yakiwchuk, John, to Raymond Lee Organization, Inc., The, a part interest. Portable snow blower. 4,070,771, Cl. 37-53.000.
Yamada, Masami; and Soeda, Yuji, to Tokico Ltd. Method for manufacturing bottom valve seat. 4,070,895, Cl. 72-334.000.
Yamahara, Takeshi; Takano, Tetsuo; Tamura, Mitsuhisa; and Yoshihara, Hiroshi, to Sumitomo Chemical Company, Limited. Process for producing phenols. 4,071,569, Cl. 260-621.00C.
Yamakawa, Kouichi: *See*—
Watanabe, Hiroo; Toyoshima, Kunihiko; Noutomi, Masaru; and Yamakawa, Kouichi, 4,071,448, Cl. 210-50.000.
Yamamiya, Hideki: *See*—
Koinuma, Tokuju; Yamamiya, Hideki; and Tashiro, Norio, 4,071,804, Cl. 315-39.710.
Yamamoto, Kimihiko; and Ishikawa, Hitoshi, to Aisin Seiki Kabusihki Kaisha. Sewing machine. 4,070,977, Cl. 112-259.000.
Yamamoto, Kohzo; Kawai, Syuji; and Ohmori, Akio, to Kuraray Co., Ltd. Hollow polyvinyl alcohol fibers. 4,071,454, Cl. 210-321.00A.
Yamamoto, Satomi; and Yoshii, Masataka, to Nippon Steel Corporation. Method for refining a molten steel in vacuum. 4,071,356, Cl. 75-59.000.
Yamanaka, Seisuke, to Sony Corporation. Solid state television camera. 4,071,853, Cl. 358-41.000.
Yamane, Isao, to Allis-Chalmers Corporation. Method and apparatus for making cement with preheater, kiln and heat exchanger for heating combustion air. 4,071,309, Cl. 432-14.000.
Yamaoka, Mikio: *See*—
Korekawa, Takashi; Kato, Nobuo; and Yamaoka, Mikio, 4,070,957, Cl. 99-455.000.
Yamasaki, George K., to Westinghouse Electric Corporation. Hollow-cathode spectral light source with means to prevent high voltage arcing. 4,071,802, Cl. 313-209.000.
Yamashita, Kiyoshi: *See*—
Usagawa, Yasushi; Yamashita, Kiyoshi; Nakatani, Mamoru; Masuda, Kosaku; and Kawakatsu, Satoshi, 4,071,365, Cl. 96-56.500.
Yamashita, Shiro, to Kabushiki Kaisha Daini Seikosha. Thickness-shear crystal vibrator. 4,071,786, Cl. 310-361.000.
Yamaura, Mitsuru: *See*—
Andow, Fumio; Yamaura, Mitsuru; and Kitagawa, Minoru, 4,071,873, Cl. 361-64.000.
Yamazaki, Shiro: *See*—
Aoki, Katsumichi; Shimizu, Susumu; Satake, Keigo; Yamazaki, Shiro; and Hatakeyama, Nobuo, 4,071,633, Cl. 424-324.000.
Yamazaki, Yasuo: *See*—
Ise, Katsuhiro; Kuramoto, Yoshio; and Yamazaki, Yasuo, 4,071,292, Cl. 350-128.000.
Yamine, Anthony S. Gas and vapor separator. 4,071,336, Cl. 55-203.000.
Yamshak, John R.: *See*—
Gross, William G.; Long, Henry A., Jr.; and Yamshak, John R., 4,070,987, Cl. 118-257.000.
Yanagisawa, Hiroaki; Ando, Akiko; Fukushima, Masami; and Nakao, Hideo, to Sankyo Company Limited. Process for preparing beta-lactam antibiotic substances. 4,071,681, Cl. 542-420.000.
Yang, Elmer Chensheng, to Pacific Scientific Company. Mechanical shock arrestor. 4,071,117, Cl. 188-1.00B.
Yanik, Stephen Joseph; and Frayer, James Albert, to Gulf Research & Development Company. Hydrodesulfurization shutdown method. 4,071,439, Cl. 208-216.000.
Yankovsky, Oleg Alexandrovich: *See*—
Kilin, Viktor Evdokimovich; Galimov, Anas Galimovich; Yankovsky, Oleg Alexandrovich; Klushin, Nikolai Alexandrovich; and Maslakov, Petr Avramovich, 4,071,094, Cl. 173-139.000.
Yasuda, Hiroshi: *See*—
Sugiyama, Hiroshige; and Yasuda, Hiroshi, 4,071,502, Cl. 260-75.00T.
Yasumuro, Hisakazu: *See*—
Miyamatsu, Yasunori; Yasumuro, Hisakazu; Miyata, Kenichi; Shimizu, Takashi; and Matsuoka, Kikuo, 4,070,885, Cl. 72-46.000.
Yaverbaum, Sidney: *See*—
Messing, Ralph A.; and Yaverbaum, Sidney, 4,071,409, Cl. 195-63.000.
Yokogawa, Seiji; and Takenaka, Kiyoshi, to Matsushita Electric Industrial Co., Ltd. Electric fishing float. 4,070,784, Cl. 43-17.500.
Yokoyama, Nobuo, to Nippon Oil Co., Ltd. Process for preparing modified polyolefin waxes. 4,071,581, Cl. 260-878.00R.
Yoneta, Kouichi: *See*—
Nishikubo, Michio; Miura, Sei; Toyoda, Toshiaki; Jonishi, Katsunori; and Yoneta, Kouichi, 4,070,893, Cl. 72-234.000.
Yoshida, Kazuyoshi, to Honda Giken Kogyo Kabushiki Kaisha. Power transmission for motorcycles. 4,070,925, Cl. 74-720.000.
Yoshida, Masafumi; and Obara, Hiroshi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Laminated piezoelectric matrix switch. 4,071,785, Cl. 310-331.000.

Yoshihara, Hiroshi: *See*—
Yamahara, Takeshi; Takano, Tetsuo; Tamura, Mitsuhisa; and Yoshihara, Hiroshi, 4,071,569, Cl. 260-621.00C.

Yoshii, Masataka: *See*—
Yamamoto, Satomi; and Yoshii, Masataka, 4,071,356, Cl. 75-59.000.

Yoshimatsu, Shiro: *See*—
Nakagawa, Ryuichi; Yoshimatsu, Shiro; Ueda, Takuya; Fukuzawa, Akira; Ozaki, Tsuyoshi; Sato, Akira; and Mitsui, Tatsuro, 4,071,687, Cl. 13-10.000.

Yoshimura, Toshimitsu; and Matsuda, Minoru, to Honda Giken Kogyo Kabushiki Kaisha. Apparatus for controlling secondary air for cleaning exhaust gases. 4,070,829, Cl. 60-290.000.

Yoshizawa, Masayuki, to Eisai Co., Ltd. Process for preparation of pancreatic elastase. 4,071,410, Cl. 195-66.00R.

Young, Joseph C.: *See*—
Sneed, Robert C.; and Young, Joseph C., 4,071,203, Cl. 242-86.600.

Yu, Arthur J.; and Anderson, Donald F., to Stauffer Chemical Company. Emulsion polymerization of vinyl chloride using mixed emulsifier system in a single step in the absence of seed formation. 4,071,675, Cl. 526-193.000.

Zadra, Mario D.: *See*—
Tazuma, James J.; and Zadra, Mario D., 4,071,669, Cl. 526-47.300.

Zagar, Marjan: *See*—
Raspet, Jernej; and Zagar, Marjan, 4,071,069, Cl. 152-213.00A.

Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Hamada, Masa; Takamatsu, Akira; and Oki, Toshikazu, 4,071,411, Cl. 195-80.00R.

Zaklady Azotowe im. F. Dzierzinskiego: *See*—
Ciborowski, Stanislaw; Szczypinski, Zbigniew; Balcerzak, Kazimierz; Jaworski, Andrzej; Kasznia, Andrzej; Krzysztoforski, Andrzej; Kurowski, Stanislaw; Redzi, Jan; and Szparski, Jozef, 4,071,561, Cl. 260-586.00P.

Zapala, Raymond J., to United States of America, Air Force. Flexible recording head mounting assembly. 4,071,864, Cl. 360-103.000.

Zarechensky, Anatoly Vasilievich; Kolechko, Alexei Afanasievich; Manov, Vladimir Mikhailovich; Korjukova, Alla Grigorievna; Savran, Vasily Grigorievich; and Serenko, Alexandr Nikitich. Powder electrode strip for surfacing with wear-resistant alloy. 4,071,734, Cl. 219-146.310.

Zeeh, Bernd: *See*—
Jung, Johann; Kiehs, Karl; Zeeh, Bernd; and Theobald, Hans, 4,071,551, Cl. 260-501.150.
Rentzea, Costin; Zeeh, Bernd; Koenig, Karl-Heinz; and Pommer, Ernst-Heinrich, 4,071,685, Cl. 548-312.000.

Zehe, Alfred, to Heidelberger Druckmaschinen Aktiengesellschaft. Gripper for printing machines. 4,070,968, Cl. 101-408.000.

Zemanek, Joseph, Jr., to Mobil Oil Corporation. Well logging system for measuring remanent magnetic fields in the earth. 4,071,815, Cl. 324-8.000.

Zengel, Hans; and Bergfeld, Manfred, to Akzona Incorporated. Benzene-1,3,5-tris-acetoxime and the process for making phloroglucinol therewith. 4,071,555, Cl. 260-566.00A.

Zent, Lawson J. Adjustable resistance exercising apparatus. 4,071,235, Cl. 272-73.000.

Zentmyer, John Hobart. Method and circuit for operating an electrical flash-tube. 4,071,808, Cl. 315-241.00R.

Zheleznova, Nina Vsevolodovna: *See*—
Peradze, Tamaz Vladimirovich; Fridman, Eidlya Abramovna; Zheleznova, Nina Vsevolodovna; Kolikov, Vsevolod Mikhailovich; Bresler, Semen Khaimovich-Efimovich; Mchedlishvili, Boris Viktorovich; Molodkin, Viktor Mikhailovich; Molodkina, Ljudmila Mikhailovna; and Katushkina, Nina Vasilievna, 4,071,619, Cl. 424-90.000.

Zherdev, Anatoly Vasilievich; Yakimenko, Grigory Savvich; Gritsuk, Lev Dmitrievich; Gorbik, Anatoly Stepanovicy; Belkin, Evgeny Grigorievich; Tseluiko, Jury Ivanovich; Gorodetsky, Yakov Izrailievich; Severin, Vasily Fedorovich; and Tolochko, Alexei Ivanovich. Contrivance for the protection of the walls of a shaft furnace from the heat effect of metallurgical process. 4,071,230, Cl. 266-193.000.

Zimmerman, Sheldon B.; and Chalmers, John H., Jr., to Merck & Co., Inc. Antibiotic A21A. 4,071,631, Cl. 424-263.000.

Zioni, Dov: *See*—
Halperin, Levi Ytzhak; Zioni, Dov; and Bennet, David, 4,071,116, Cl. 187-29.00R.

Zouhar, Drahomir; Holas, Antonin; and Musil, Ivan, to Elitex - Zavody textilniho strojirenstvi generalni reditelstvi. One piece pantyhose and method of manufacturing same. 4,070,874, Cl. 66-177.000.

Zubarev, Anatoly Ivanovich; Osipovsky, Lev Fedorovich; and Shipov, Stanislav Valeryanovich. Air percussion boring machine. 4,071,093, Cl. 173-105.000.

Zuckerman, Irving. Information locating system and method. 4,070,768, Cl. 35-8.00R.

Zumsteg, Alphonse Ernst; Engdahl, Jean; and Huguenin, Raymond, to Societe Suisse pour l'Industrie Horlogere Management Services S.A. Quartz piezo-electric element vibrating in a coupled mode. 4,071,797, Cl. 310-361.000.

Zwagemakers, Johannes Maria Antonius: *See*—
van Dijk, Jan; Claassen, Volkert; and Zwagemakers, Johannes Maria Antonius, 4,071,686, Cl. 560-35.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 31ST DAY OF JANUARY, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Ampex Corporation: *See*—
Heaslett, Alastair M., Re. 29,529, Cl. 330-107.000.

Bowman, Edward W., deceased (by Bowman, Muriel B., co-executor), to E. W. Bowman, Incorporated. Jet fired zonal lehr for applying treating medium inside and outside of glass containers simultaneously. Re. 29,528, Cl. 65-119.000.

Bowman, Muriel B., co-executor: *See*—
Bowman, Edward W., deceased, Re. 29,528, Cl. 65-119.000.

Duo Fast Corporation: *See*—
Ramspeck, Howard B.; and Obergfell, Allen R., Re. 29,527, Cl. 227-8.000.

E. W. Bowman, Incorporated: *See*—
Bowman, Edward W., deceased, Re. 29,528, Cl. 65-119.000.

Heaslett, Alastair M., to Ampex Corporation. Equalization circuit. Re. 29,529, Cl. 330-107.000.

Hill, Bernhard: *See*—
Krumme, Jens-Peter; and Hill, Bernhard, Re. 29,530, Cl. 365-122.000.

Jeter, John D. Directional drilling apparatus. Re. 29,526, Cl. 175-73.000.

Krumme, Jens-Peter; and Hill, Bernhard, to U.S. Philips Corporation. Magneto-optical information storage device using photoconductive control element. Re. 29,530, Cl. 365-122.000.

Obergfell, Allen R.: *See*—
Ramspeck, Howard B.; and Obergfell, Allen R., Re. 29,527, Cl. 227-8.000.

Ramspeck, Howard B.; and Obergfell, Allen R., to Duo Fast Corporation. Safety for fastener driving tool. Re. 29,527, Cl. 227-8.000.

U.S. Philips Corporation: *See*—
Krumme, Jens-Peter; and Hill, Bernhard, Re. 29,530, Cl. 365-122.000.

LIST OF PLANT PATENTEES

Mikkelsen, James C., to Mikkelsens, Inc. Impatiens plant. 4,202, 1-31-78, Cl. 68.000.

Mikkelsen, James C., to Mikkelsens, Inc. Impatiens plant. 4,203, 1-31-78, Cl. 68.000.

Mikkelsen, James C., to Mikkelsens, Inc. Impatiens plant. 4,204, 1-31-78, Cl. 68.000.

Mikkelsen, James C., to Mikkelsens, Inc. Impatiens plant. 4,205, 1-31-78, Cl. 68.000.

Mikkelsens, Inc.: *See*—
Mikkelsen, James C., 4,202, Cl. 68.000.
Mikkelsen, James C., 4,203, Cl. 68.000.
Mikkelsen, James C., 4,204, Cl. 68.000.
Mikkelsen, James C., 4,205, Cl. 68.000.

LIST OF DESIGN PATENTEES

Abrams Fixture Corporation: *See*—
Stoddard, David C. F., 247,085, Cl. D6-257.000.

Almqvist & Wiksell Laromedel AB: *See*—
Nilsson, Folke B.; and Lindahl, Bengt Erik, 247,119, Cl. D19-59.000.

Beecher, Robert A. Nutrient feeding container for animals. 247,124, 1-31-78, Cl. D30-16.000.

Benes, Vladimir. Lipstick tube holder. 247,123, 1-31-78, Cl. D28-86.000.

Boatwright, Edward P.: *See*—
Thompson, Dick J.; and Boatwright, Edward P., 247,082, Cl. D6-192.000.

Britt, William James, to Morton-Norwich Products, Inc. Bottle. 247,094, 1-31-78, Cl. D9-129.000.

Caburian, Eugenio D.: *See*—
Evangelista, Bisked U.; and Caburian, Eugenio D., 247,092, Cl. D9-66.000.

Cambra Cases Limited: *See*—
Woodhall, Michael B., 247,135, Cl. D87-1.00D.

Cantalupo, Josephine I. Toy clown doll having two faces. 247,128, 1-31-78, Cl. D34-4.00A.

Carrousel Party Favors, Inc.: *See*—
Tiep, Darin M., 247,133, Cl. D34-15.00R.

Cartier, Inc.: *See*—
Durante, Alfred Joseph, 247,101, Cl. D11-4.000.
Durante, Alfred Joseph, 247,102, Cl. D11-5.000.

Chan, Sanford A.: *See*—
Corbett, Karl; and Chan, Sanford A., 247,125, Cl. D34-2.00R.

Coca-Cola Company, The: *See*—
Davis, Charles L., 247,081, Cl. D6-186.000.

Compagnie Generale des Etablissements Michelin: *See*—
Jamain, Philippe, 247,107, Cl. D12-146.000.
Jamain, Philippe, 247,109, Cl. D12-148.000.
Peron, Jean-Claude, 247,108, Cl. D12-147.000.

Contico International, Inc.: *See*—
Dickinson, Thomas, 247,087, Cl. D7-194.000.

Corbett, Karl; and Chan, Sanford A. Puppet or similar article. 247,125, 1-31-78, Cl. D34-2.00R.

Cox, Ivan Ray; and Reynolds, Donald Gene, to Rayden Enterprises, Inc. Microphone mount. 247,115, 1-31-78, Cl. D14-13.000.

Davis, Charles L., to Coca-Cola Company, The. Mobile display rack. 247,081, 1-31-78, Cl. D6-186.000.

De Mascole, Louis P.; and Tatro, Donald C. Hanger for organizing jewelry. 247,084, 1-31-78, Cl. D6-247.000.

Deutsche Texaco Aktiengesellschaft: *See*—
Geisler, Hans P. L., 247,134, Cl. D52-2.00A.

Dickinson, Thomas, to Contico International, Inc. Waste receptacle. 247,087, 1-31-78, Cl. D7-194.000.

Dimensionetix, Inc.: *See*—
Gruber, George S., 247,077, Cl. D6-91.000.
Gruber, George S., 247,083, Cl. D6-192.000.

Dorcy Cycles Corporation: *See*—
Federowicz, Raymond J.; Hess, William J.; and Ricciardi, Frank C., Jr., 247,113, Cl. D12-158.000.

Dunlop Limited: *See*—
Morgan, Peter William Swift, 247,072, Cl. D2-224.000.

Durante, Alfred Joseph, to Cartier, Inc. Wire bracelet with detachable diamond clasp. 247,101, 1-31-78, Cl. D11-4.000.

Durante, Alfred Joseph, to Cartier, Inc. Diamond and wire bracelet. 247,102, 1-31-78, Cl. D11-5.000.

Ebner, John S.; Steinman, Sheldon; and Haase, Frederick W., to Milgo Electronics Corporation. Modem-control access panel. 247,114, 1-31-78, Cl. D13-35.000.

Ebner, John Steven; and Sprecher, Charles Grimes, to Milgo Electronics Corporation. Housing for a data terminal logic module or similar article. 247,116, 1-31-78, Cl. D14-46.000.

Evangelista, Bisked U.; and Caburian, Eugenio D. Bottle. 247,092, 1-31-78, Cl. D9-66.000.

Federowicz, Raymond J.; Hess, William J.; and Ricciardi, Frank C., Jr., to Dorcy Cycles Corporation. Bicycle carrier for automobiles. 247,113, 1-31-78, Cl. D12-158.000.

Ferrante, Rafael. Dispenser for pulverous and granular substances. 247,098, 1-31-78, Cl. D9-208.000.

Fimreite, Marjorie K.; and Thomas, Ruth E. Doll. 247,129, 1-31-78, Cl. D34-4.00R.

Geisler, Hans P. L., to Deutsche Texaco Aktiengesellschaft. Gasoline pump. 247,134, 1-31-78, Cl. D52-2.00A.

Gnehm, Charles H. Toy vehicle. 247,132, 1-31-78, Cl. D34-15.0AJ.

Gonshorek, Milton, to International Silver Company. Article of flatware. 247,086, 1-31-78, Cl. D7-137.000.
Graham, Roger. Smoking device. 247,121, 1-31-78, Cl. D27-03.000.
Gruber, George S., to Dimensionetix, Inc. Combined towel caddy and tissue dispenser. 247,077, 1-31-78, Cl. D6-91.000.
Gruber, George S., to Dimensionetix, Inc. Combined vanity skirt and tissue dispenser. 247,083, 1-31-78, Cl. D6-192.000.
Grusin, Gerald M. Book support. 247,078, 1-31-78, Cl. D6-106.000.
Haase, Frederick W.: *See—*
Ebner, John S.; Steinman, Sheldon; and Haase, Frederick W., 247,114, Cl. D13-35.000.
Hanson, Thomas E.; and Martin, Daniel A., to SCM Corporation. Steam iron. 247,088, 1-31-78, Cl. D7-202.000.
Hanson, Thomas E.; and Martin, Daniel A., to SCM Corporation. Steam iron. 247,089, 1-31-78, Cl. D7-202.000.
Hanson, Thomas E.; and Martin, Daniel A., to SCM Corporation. Steam iron. 247,090, 1-31-78, Cl. D7-202.000.
Henry, George. Platform type shoe sole. 247,074, 1-31-78, Cl. D2-322.000.
Hess, William J.: *See—*
Federowicz, Raymond J.; Hess, William J.; and Ricciardi, Frank C., Jr., 247,113, Cl. D12-158.000.
International Silver Company: *See—*
Gonshorek, Milton, 247,086, Cl. D7-137.000.
Jamain, Philippe, to Compagnie Generale des Etablissements Michelin. Tire. 247,107, 1-31-78, Cl. D12-146.000.
Jamain, Philippe, to Compagnie Generale des Etablissements Michelin. Tire. 247,109, 1-31-78, Cl. D12-148.000.
Johnson, Roland: *See—*
Torongo, Albert H.; and Johnson, Roland, 247,093, Cl. D9-116.000.
Kane, William F.; and Richardson, Melvin R., to SneakSlides of California. Design for a shoe. 247,073, 1-31-78, Cl. D2-308.000.
Kavka, Miroslav. Combined hockey and pool game table. 247,127, 1-31-78, Cl. D34-3.000.
Kelley, Ann E. Game board. 247,130, 1-31-78, Cl. D34-5.0SS.
Kovach, Robert L. Combined table and terrarium. 247,105, 1-31-78, Cl. D11-144.000.
Krusche, Kurt. Combined cleaning implement handle and interchangeable heads therefor. 247,075, 1-31-78, Cl. D4-12.000.
Lindahl, Bengt Erik: *See—*
Nilsson, Folke B.; and Lindahl, Bengt Erik, 247,119, Cl. D19-59.000.
Lossini, Elio, to Raybeth Tool & Die Co., Inc. Identification bracelet. 247,103, 1-31-78, Cl. D11-12.000.
MacCollum, Mary C. Brush. 247,076, 1-31-78, Cl. D4-35.000.
MacMillan, Kenneth T. Tire retreading bladder. 247,118, 1-31-78, Cl. D15-199.000.
Martin, Daniel A.: *See—*
Hanson, Thomas E.; and Martin, Daniel A., 247,088, Cl. D7-202.000.
Hanson, Thomas E.; and Martin, Daniel A., 247,089, Cl. D7-202.000.
Hanson, Thomas E.; and Martin, Daniel A., 247,090, Cl. D7-202.000.
Matsushita Electric Industrial Co., Ltd.: *See—*
Yoshida, Toshihiko; and Ueda, Yoshiaki, 247,117, Cl. D15-52.000.
Milgo Electronics Corporation: *See—*
Ebner, John S.; Steinman, Sheldon; and Haase, Frederick W., 247,114, Cl. D13-35.000.
Ebner, John Steven; and Sprecher, Charles Grimes, 247,116, Cl. D14-46.000.
Morgan, Peter William Swift, to Dunlop Limited. Skirt. 247,072, 1-31-78, Cl. D2-224.000.
Morton-Norwich Products, Inc.: *See—*
Britt, William James, 247,094, Cl. D9-129.000.
Nabisco, Inc.: *See—*
Neidenberg, Jay R.; Warren, Dewey L.; Oppedisano, Eugene D.; and Thulin, Robert R., 247,071, Cl. D1-23.000.
Neidenberg, Jay R.; Warren, Dewey L.; Oppedisano, Eugene D.; and Thulin, Robert R., to Nabisco, Inc. Cracker. 247,071, 1-31-78, Cl. D1-23.000.
Nilsson, Folke B.; and Lindahl, Bengt Erik, to Almqvist & Wiksell Laromedel AB. Music teaching aid. 247,119, 1-31-78, Cl. D19-59.000.
Novel, Robert P. Statuette. 247,104, 1-31-78, Cl. D11-131.000.
Olivan, Andre J. Truck cab caddy. 247,110, 1-31-78, Cl. D12-155.000.
Olivan, Andre J. Truck cab caddy. 247,111, 1-31-78, Cl. D12-155.000.
Olivan, Andre J. Truck cab caddy. 247,112, 1-31-78, Cl. D12-155.000.
Oppedisano, Eugene D.: *See—*
Neidenberg, Jay R.; Warren, Dewey L.; Oppedisano, Eugene D.; and Thulin, Robert R., 247,071, Cl. D1-23.000.
Otema, Martin. Cabinet. 247,079, 1-31-78, Cl. D6-172.000.
Owens-Illinois, Inc.: *See—*
Weckman, Richard L., 247,095, Cl. D9-157.000.
Weckman, Richard L., 247,096, Cl. D9-157.000.
Peron, Jean-Claude, to Compagnie Generale des Etablissements Michelin. Tire. 247,108, 1-31-78, Cl. D12-147.000.
Preece, Lionel Peter. Needle package. 247,097, 1-31-78, Cl. D9-172.000.
Procter & Gamble Company, The: *See—*
Torongo, Albert H.; and Johnson, Roland, 247,093, Cl. D9-116.000.
Raybeth Tool & Die Co., Inc.: *See—*
Lossini, Elio, 247,103, Cl. D11-12.000.
Rayden Enterprises, Inc.: *See—*
Cox, Ivan Ray; and Reynolds, Donald Gene, 247,115, Cl. D14-13.000.
Reynolds, Donald Gene: *See—*
Cox, Ivan Ray; and Reynolds, Donald Gene, 247,115, Cl. D14-13.000.
Ricciardi, Frank C., Jr.: *See—*
Federowicz, Raymond J.; Hess, William J.; and Ricciardi, Frank C., Jr., 247,113, Cl. D12-158.000.
Richardson, Melvin R.: *See—*
Kane, William F.; and Richardson, Melvin R., 247,073, Cl. D2-308.000.
Rite Autotronics Corporation: *See—*
Schwartz, Edwin L., 247,099, Cl. D10-56.000.
Schwartz, Edwin L., 247,100, Cl. D10-78.000.
Robinson, Fuller, to Standard Desk Limited. Table. 247,080, 1-31-78, Cl. D6-177.000.
Sandorf, Alexander E. Gardening and agriculture hand tool. 247,091, 1-31-78, Cl. D8-11.000.
Schwartz, Edwin L., to Rite Autotronics Corporation. Moisture meter. 247,099, 1-31-78, Cl. D10-56.000.
Schwartz, Edwin L., to Rite Autotronics Corporation. Ignition analyzer. 247,100, 1-31-78, Cl. D10-78.000.
SCM Corporation: *See—*
Hanson, Thomas E.; and Martin, Daniel A., 247,088, Cl. D7-202.000.
Hanson, Thomas E.; and Martin, Daniel A., 247,089, Cl. D7-202.000.
Hanson, Thomas E.; and Martin, Daniel A., 247,090, Cl. D7-202.000.
Siebert, Carl J. Dryer for welding rods. 247,120, 1-31-78, Cl. D23-77.000.
Simmoneau, Ted R. Novelty tennis racket having two handles. 247,131, 1-31-78, Cl. D34-5.0ST.
SneakSlides of California: *See—*
Kane, William F.; and Richardson, Melvin R., 247,073, Cl. D2-308.000.
Sprecher, Charles Grimes: *See—*
Ebner, John Steven; and Sprecher, Charles Grimes, 247,116, Cl. D14-46.000.
Standard Desk Limited: *See—*
Robinson, Fuller, 247,080, Cl. D6-177.000.
Steinman, Sheldon: *See—*
Ebner, John S.; Steinman, Sheldon; and Haase, Frederick W., 247,114, Cl. D13-35.000.
Stoddard, David C. F., to Abrams Fixture Corporation. Hanger support for display racks. 247,085, 1-31-78, Cl. D6-257.000.
Tatro, Donald C.: *See—*
De Mascole, Louis P.; and Tatro, Donald C., 247,084, Cl. D6-247.000.
Thomas, Ruth E.: *See—*
Fimreite, Marjorie K.; and Thomas, Ruth E., 247,129, Cl. D34-4.00R.
Thompson, Dick J.; and Boatwright, Edward P. End standard for a furniture seat. 247,082, 1-31-78, Cl. D6-192.000.
Thulin, Robert R.: *See—*
Neidenberg, Jay R.; Warren, Dewey L.; Oppedisano, Eugene D.; and Thulin, Robert R., 247,071, Cl. D1-23.000.
Tiep, Darin M., to Carrousel Party Favors, Inc. Toy digital watch. 247,133, 1-31-78, Cl. D34-15.00R.
Torongo, Albert H.; and Johnson, Roland, to Procter & Gamble Company, The. Bottle. 247,093, 1-31-78, Cl. D9-116.000.
Tortorete, Michael A. Vase. 247,106, 1-31-78, Cl. D11-147.000.
Ueda, Yoshiaki: *See—*
Yoshida, Toshihiko; and Ueda, Yoshiaki, 247,117, Cl. D15-52.000.
Warren, Dewey L.: *See—*
Neidenberg, Jay R.; Warren, Dewey L.; Oppedisano, Eugene D.; and Thulin, Robert R., 247,071, Cl. D1-23.000.
Weckman, Richard L., to Owens-Illinois, Inc. Bottle. 247,095, 1-31-78, Cl. D9-157.000.
Weckman, Richard L., to Owens-Illinois, Inc. Bottle. 247,096, 1-31-78, Cl. D9-157.000.
Whitmer, Leo C. Animal toy. 247,126, 1-31-78, Cl. D34-2.00R.
Woodhall, Michael B., to Cambra Cases Limited. Disc record storage unit tray. 247,135, 1-31-78, Cl. D87-1.00D.
Yoshida, Toshihiko; and Ueda, Yoshiaki, to Matsushita Electric Industrial Co., Ltd. Vacuum cleaner. 247,117, 1-31-78, Cl. D15-52.000.
Yoshinaga Prince Co., Ltd.: *See—*
Yoshinaga, Sadao, 247,122, Cl. D27-42.000.
Yoshinaga, Sadao, to Yoshinaga Prince Co., Ltd. Cigarette lighter. 247,122, 1-31-78, Cl. D27-42.000.

CLASSIFICATION OF PATENTS

ISSUED JANUARY 31, 1978

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

10 4,070,712
168 4,070,713

CLASS 4

318 4,070,714

CLASS 5

2 R 4,070,715
62 4,070,720
89 4,070,721
99 C 4,070,716
176 R 4,070,717
207 4,070,718
355 4,070,719

CLASS 8

7 4,071,312
127.6 4,071,313

CLASS 9

5 4,070,722

CLASS 10

90 4,070,723
162 R 4,070,724

CLASS 12

86.7 4,070,725

CLASS 13

10 4,071,687

CLASS 15

231 4,070,726

CLASS 16

72 4,070,727
134 4,070,728

CLASS 17

34 4,070,729

CLASS 19

58 4,070,730
159 R 4,070,731
236 4,070,732

CLASS 23

230 B 4,071,314
4,071,315
4,071,316
253 TP 4,071,317
4,071,318
4,071,321
254 R 4,071,319
259 4,071,320
262 4,071,322
273 R 4,071,323
288 K 4,071,324
290 4,071,325

CLASS 24

27 4,070,733
28 4,070,734
73 VA 4,070,735
153 4,070,736

CLASS 27

12 4,070,737

CLASS 28

137 4,070,738

CLASS 29

18 4,070,739
25.19 4,070,740
25.42 4,070,741
110.5 4,070,742
227 4,070,743
241 4,070,744
268 4,070,745
450 4,070,746
570 4,070,747
577 C 4,070,748
592 R 4,070,749
596 4,070,750
628 4,070,751
630 B 4,070,752
741 4,070,753
749 4,070,754
764 4,070,755
809 4,070,756

CLASS 30

371 4,070,757

CLASS 33

76 R 4,070,758
125 C 4,070,759
166 4,070,760
172 F 4,070,761
174 Q 4,070,762
241 4,070,763
342 4,070,764

CLASS 34

10 4,070,765
12 4,070,766
33 4,070,767

CLASS 35

8 R 4,070,768
10.4 4,070,769

CLASS 36

43 4,070,770

CLASS 37

53 4,070,771
117.5 4,070,772

CLASS 38

77.83 4,070,773

CLASS 40

2.2 4,070,774
124.1 4,070,778
152 4,070,780
219 4,070,781
323 4,070,782
381 4,070,776
406 4,070,777
492 4,070,775
575 4,070,779

CLASS 42

69 R 4,070,783

CLASS 43

17.5 4,070,784
24 4,070,785
55 4,070,786
94 4,070,787
100 4,070,788

CLASS 44

1 R 4,071,328
7 E 4,071,326
66 4,071,327

CLASS 46

12 4,070,789
172 4,070,790
220 4,070,791
4,070,792

CLASS 47

67 4,070,793
79 4,070,794

CLASS 48

62 R 4,071,329
94 4,071,330
197 R 4,071,331
202 4,071,332

CLASS 49

141 4,070,795

CLASS 51

304 4,071,333
309 R 4,070,796
326 4,070,797
361 4,070,798
426 4,070,799

CLASS 52

1 4,070,800
2 4,070,801
23 4,070,802
36 4,070,803
64 4,070,804
86 4,070,805
95 4,070,806
109 4,070,807
122 4,070,808
125 4,070,832
148 4,070,833
166 4,070,834
235 4,070,835
245 4,070,836
297 4,070,837
400 4,070,838
448 4,070,839
489 4,070,840
506 4,070,841
508 4,070,842
521 4,070,843
584 4,070,844
632 4,070,845
641 4,070,846
650 4,070,847
707 4,070,848
742 4,070,849

CLASS 53

48 4,070,850
228 4,070,851
297 4,070,852
373 4,070,853
381 A 4,070,854

CLASS 55

2 4,071,334
68 4,071,335
203 4,071,336
212 4,071,337
385 C 4,071,338

CLASS 56

13.9 4,070,809
291 4,070,810

CLASS 57

50 4,070,811
58.89 4,070,812
4,070,813
89 4,070,814
140 J 4,070,815
153 4,070,816
157 TS 4,070,817
160 4,070,818

CLASS 58

2 4,070,819
21.13 4,070,820
23 BA 4,070,821
38 R 4,070,822

CLASS 59

93 4,070,823

CLASS 60

39.43 4,070,824
39.51 R 4,070,825
39.66 4,070,826
204 4,070,827
274 4,070,828
290 4,070,829
4,070,830
371 4,070,831
407 4,070,855
4,070,856
422 4,070,857
4,070,858
530 4,070,859
616 4,070,860
641 4,070,861
655 4,070,862

CLASS 61

28 4,070,863
29 4,070,864
36 C 4,070,865
45 R 4,070,866
53 4,070,867
91 4,070,868
100 4,070,869

CLASS 62

2 4,070,870
116 4,070,871

CLASS 64

21 4,070,872

CLASS 65

3 R 4,071,339
11 R 4,071,340
4,071,342
11 W 4,071,341
23 4,071,343
29 4,071,344
119 Re.29,528
273 4,071,345
351 4,071,346

CLASS 66

172 R 4,070,873
177 4,070,874

CLASS 68

3 R 4,070,876
3 SS 4,070,875
5 D 4,070,877
22 R 4,070,878

CLASS 70

20 4,070,879
240 4,070,880
315 4,070,881
427 4,070,882

CLASS 71

31 4,071,347
78 4,071,348
88 4,071,349
100 4,071,350
4,071,351
4,071,352
4,071,353

CLASS 72

14 4,070,883
39 4,070,884
46 4,070,885
49 4,070,886
52 4,070,887
91 4,070,888
114 4,070,889
129 4,070,890
183 4,070,891
195 4,070,892
234 4,070,893
292 4,070,894
329 4,071,360
334 4,070,895
345 4,070,897
389 4,070,896
409 4,070,898
457 4,070,899

CLASS 73

1 B 4,070,900
2 4,070,901
37.5 4,070,902
38 4,070,903
40.5 R 4,070,904
88 E 4,070,906
119 A 4,070,907
170 R 4,070,908
182 4,070,909
239 4,070,910
343 R 4,070,911
356 4,070,912
422 GC 4,070,913
487 4,070,915
490 4,070,916
598 4,070,917
614 4,070,905

CLASS 74

70 4,070,918
229 4,070,919
446 4,070,920
459 4,070,921
475 4,070,914
573 R 4,070,922
665 P 4,070,923
710.5 4,070,924
720 4,070,925
730 4,070,926
765 4,070,927
863 4,070,928

CLASS 75

.5 R 4,071,354
30 4,071,355
59 4,071,356
103 4,071,357
154 4,071,358
160 4,071,359

CLASS 76

82 4,070,929

CLASS 81

9.5 B 4,070,930
177 A 4,070,932
177 B 4,070,931
180 B 4,070,933

CLASS 82

2 R 4,070,934
40 R 4,070,935

CLASS 83

12 4,070,936
27 4,070,937
71 4,070,938
368 4,070,939
464 4,070,940
478 4,070,941

CLASS 84

1.01 4,070,942
4,070,943
484 4,070,944

CLASS 85

80 4,070,945

CLASS 91

25 4,070,946
39 4,070,947
234 4,070,948
276 4,070,949
487 4,070,950

CLASS 93

8 R 4,070,951
36.9 4,070,954
39.1 R 4,070,953
53 R 4,070,952

CLASS 96

1.4 4,071,361
4,071,362
1.5 R 4,071,363
36 4,071,364
56.5 4,071,365
73 4,071,366
79 4,071,367

CLASS 99

284 4,070,955
304 4,070,956
455 4,070,957
468 4,070,958
510 4,070,959

CLASS 100

49 4,070,960
185 4,070,961
209 4,070,962

CLASS 101

93.29 4,070,963
120 4,070,964
228 4,070,965
269 4,070,966
301 4,070,967
408 4,070,968
465 4,070,969

CLASS 102

28 R 4,070,970

CLASS 104

172 S 4,070,972

CLASS 106

38.28 4,071,368
40 R 4,071,369
59 4,071,370
65 4,071,371
73.5 4,071,372
104 4,071,373
189 4,071,374
238 4,071,375

CLASS 108

20 4,070,973

CLASS 111

85 4,070,974

CLASS 112

135 4,070,975
241 4,070,976
259 4,070,977

CLASS 114

26 4,070,978
263 4,070,979
4,070,980
293 4,070,981

CLASS 115

16 4,070,982
17 4,070,983
42 4,070,984

CLASS 118

6 4,070,985
7 4,070,986
257 4,070,987

CLASS 119

15.5 A 4,070,988
27 4,070,989
53 4,070,990
58 4,070,991

CLASS 122

382 4,070,992

CLASS 123

3 4,070,993
8.07 4,070,994
8.11 4,070,995
23 4,070,996
4,070,997
26 4,070,998
32 B 4,070,999
32 SP 4,071,013
51 BD 4,071,000
75 B 4,071,001
99 4,071,002
119 A 4,071,003
4,071,005
4,071,006
119 E 4,071,004
146.5 B 4,071,007
198 E 4,071,008
4,071,009
198 F 4,070,971
4,071,010

CLASS 124

41 A 4,071,014

CLASS 125

11 AT 4,071,015

CLASS 126

270 4,071,016
271 4,071,017
4,071,018
299 E 4,071,019

CLASS 128

2 A 4,071,020
52 4,071,021
94 4,071,022
133 4,071,023
145 A 4,071,024
145.7 4,071,025
147 4,071,026
231 4,071,027
303.14 4,071,028
305 4,071,029
310 4,071,030
402 4,071,031
419 P 4,071,032
420 A 4,071,033

CLASS 131

17 R 4,071,034
173 4,071,035
187 4,071,036
266 4,071,037

CLASS 134

1 4,071,376
29 4,071,377

CLASS 137

59 4,071,038
87 4,071,039
199 4,071,040
246.22 4,071,041
317 4,071,011
321 4,071,012

332 4,071,042
375 4,071,043
479 4,071,044
528 4,071,045
596.15 4,071,046
625.18 4,071,047

CLASS 138

145 4,071,048

CLASS 139

159 4,071,049
383 R 4,071,050
436 4,071,051
4,071,052
4,071,053
4,071,054
448 4,071,055
449 4,071,056

CLASS 141

4 4,071,057
65 4,071,058
206 4,071,059

CLASS 144

3 H 4,071,060
314 R 4,071,061

CLASS 148

1.5 4,071,378
6.15 R 4,071,380
6.15 Z 4,071,379
36 4,071,381
126 4,071,382
175 4,071,383

CLASS 150

1.5 B 4,071,062
12 4,071,063
48 4,071,064
52 J 4,071,066
52 R 4,071,065

CLASS 151

22 4,071,067

CLASS 152

176 4,071,068
213 A 4,071,069
333 4,071,070

CLASS 156

71 4,071,384
73.1 4,071,385
113 4,071,386
148 4,071,387
157 4,071,388
175 4,071,389
239 4,071,390
325 4,071,391
351 4,071,392
353 4,071,393
465 4,071,394
499 4,071,395
612 4,071,396
662 4,071,397

CLASS 157

13 4,071,071

CLASS 162

15 4,071,398
16 4,071,399
169 4,071,400
300 4,071,401

CLASS 164

89 4,071,072
448 4,071,073
4,071,074

CLASS 165

2 4,071,075
9 4,071,076
18 4,071,077
27 4,071,078
48 4,071,079
59 4,071,080
82 4,071,081
101 4,071,082
173 4,071,083

CLASS 166

84 4,071,085
129 4,071,084
177 4,071,086
278 4,071,087
321 4,071,088

CLASS 172

59 4,071,089
788 4,071,090
797 4,071,091

CLASS 173

12 4,071,092
105 4,071,093
139 4,071,094
152 4,071,095

CLASS 174

138 R 4,071,688

CLASS 175

4.6 4,071,096
53 4,071,098
56 4,071,097
59 4,071,099
69 4,071,100
73 Re.29,526
325 4,071,101

CLASS 176

27 4,071,402
50 4,071,403
87 4,071,404

CLASS 177

165 4,071,102
188 4,071,103
229 4,071,104

CLASS 178

18 4,071,689
4,071,690
19 4,071,691
68 4,071,692
69.1 4,071,693

CLASS 179

1 PC 4,071,696
1 ST 4,071,694
1 VL 4,071,695
2 R 4,071,698
2 TV 4,071,697
5.5 4,071,699
15 AL 4,071,706
15 AQ 4,071,703
15 AT 4,071,701
4,071,702
15 BA 4,071,705
15 BF 4,071,700
4,071,704
15.55 R 4,071,707
16 E 4,071,708
18 HB 4,071,709
37 4,071,710
41 A 4,071,711
81 A 4,071,713
82 4,071,714
90 K 4,071,715
99 4,071,712
100.1 DR 4,071,716
182 R 4,071,717

CLASS 180

14 R 4,071,105
44 F 4,071,106
69 R 4,071,107
139 4,071,108
143 4,071,109

CLASS 181

127 4,071,110
149 4,071,111
187 4,071,112

CLASS 182

181 4,071,113

CLASS 185

30 4,071,114

CLASS 187

2 4,071,115
29 R 4,071,116

CLASS 188

1 B 4,071,117
71.9 4,071,118
79.5 K 4,071,120
196 P 4,071,121
285 4,071,122
298 4,071,119
331 4,071,123

CLASS 191

12 R 4,071,124

CLASS 192

3.3 4,071,125
87.12 4,071,126
107 R 4,071,127
133 4,071,128

CLASS 195

29 4,071,405
31 P 4,071,406
62 4,071,407
4,071,408
63 4,071,409
66 R 4,071,410
80 R 4,071,411
102 4,071,412
103.5 R 4,071,413

CLASS 197

1 R 4,071,130
6.4 4,071,131
168 4,071,132
4,071,133
181 4,071,134

CLASS 198

324 4,071,135
735 4,071,136
774 4,071,137

CLASS 200

5 A 4,071,718
5 B 4,071,719
6 B 4,071,720
38 B 4,071,721
50 A 4,071,722
61.25 4,071,724
61.45 R 4,071,723
82 E 4,071,725
144 B 4,071,727
175 4,071,728
311 4,071,726

CLASS 201

40 4,071,414

CLASS 204

14 N 4,071,415
38 B 4,071,417
38 R 4,071,416
55 R 4,071,418
4,071,419
67 4,071,420
96 4,071,421
105 R 4,071,422
158 R 4,071,423
159.15 4,071,424
159.24 4,071,425
181 C 4,071,428
192 F 4,071,426
195 M 4,071,427
231 4,071,429
299 R 4,071,430
301 4,071,431

CLASS 206

83.5 4,071,138
216 4,071,139
295 4,071,140
372 4,071,141
629 4,071,142

CLASS 208

8 4,071,432
11 LE 4,071,433
4,071,434
91 4,071,435
120 4,071,436
137 4,071,437
180 4,071,438
216 4,071,439

CLASS 209

44 4,071,440
144 4,071,441
212 4,071,442
444 4,071,143

CLASS 210

7 4,071,443
22 A 4,071,444
23 H 4,071,445
32 4,071,446
44 4,071,447
50 4,071,448
53 4,071,449
4,071,450
79 4,071,451
189 4,071,452
232 4,071,453
321 A 4,071,454
497.1 4,071,455

CLASS 211

13 4,071,144
60 S 4,071,145
87 4,071,146

CLASS 212

145 4,071,147

CLASS 213

76 4,071,148

CLASS 214

6 P 4,071,149
16.4 R 4,071,150
35 R 4,071,151
75 R 4,071,152
82 4,071,153
145 A 4,071,154
147 G 4,071,155

CLASS 215

224 4,071,156
252 4,071,157

CLASS 219

69 C 4,071,729
85 CM 4,071,730
121 EB 4,071,731
137 R 4,071,732
141 4,071,733
146.31 4,071,734
216 4,071,735
219 4,071,736
345 4,071,737
400 4,071,738
4,071,739

CLASS 220

3.2 4,071,158
4,071,159
5 R 4,071,160
18 4,071,161
21 4,071,162
69 4,071,163
224 4,071,164

CLASS 221

259 4,071,165

CLASS 222

1 4,071,166
56 4,071,168
76 4,071,169
193 4,071,170
305 4,071,171
321 4,071,172
4,071,173

CLASS 224

29 M 4,071,174
36 4,071,175
42.1 E 4,071,176

CLASS 226

7 4,071,177
39 4,071,178

CLASS 227

8 Re.29,527

CLASS 228

1 A 4,071,179
1 R 4,071,180
43 4,071,181
110 4,071,182
159 4,071,184
173 A 4,071,183

CLASS 229

28 R 4,071,185
62 4,071,186
62.5 4,071,187

CLASS 233

29 4,071,188

CLASS 235

70 B 4,071,189
92 CV 4,071,743
92 FL 4,071,742
431 4,071,740
436 4,071,741

CLASS 236

93 A 4,071,190

CLASS 238

338 4,071,191

CLASS 239

3 4,071,192
11 4,071,193
127.3 4,071,194
289 4,071,195
492 4,071,196
533.11 4,071,197

CLASS 241

73 4,071,198

CLASS 242

25 A 4,071,199
55.2 4,071,200
4,071,201
71.1 4,071,202
86.6 4,071,203
107.4 B 4,071,204
117 4,071,205

CLASS 244

17.11 4,071,206
23 D 4,071,207
83 D 4,071,209
83 G 4,071,208
118 P 4,071,210
165 4,071,211

CLASS 248

37.6 4,071,212
74 R 4,071,213
211 4,071,214
221.4 4,071,218
251 4,071,215
290 4,071,216
309 R 4,071,217
534 4,071,219

CLASS 250

201 4,071,751
213 VT 4,071,752
227 4,071,753
4,071,754
253 4,071,755
260 4,071,756
265 4,071,757
277 CH 4,071,758
310 4,071,759
363 S 4,071,760
369 4,071,761
4,071,762
374 4,071,763
390 4,071,764
397 4,071,765
443 4,071,766
444 4,071,767
4,071,768
445 T 4,071,769
461 B 4,071,770
505 4,071,771
558 4,071,772

CLASS 251

174 4,071,220
228 4,071,221

CLASS 252

8.55 D 4,071,457
4,071,458
8.7 4,071,456
50 4,071,459
51.5 R 4,071,460
63.5 4,071,461
99 4,071,462
103 4,071,463
180 4,071,464
301.22 4,071,466
301.4 F 4,071,465
316 4,071,467
321 4,071,468
364 4,071,469
389 R 4,071,470
392 4,071,746
437 4,071,471
455 R 4,071,472
462 4,071,473
500 4,071,474
545 4,071,475
557 4,071,476

CLASS 254

8 C 4,071,222

CLASS 256

1 4,071,223
64 4,071,224

CLASS 260

2 N 4,071,477
2 R 4,071,478
2.3 4,071,479
2.5 AH 4,071,483
2.5 AJ 4,071,482
2.5 AT 4,071,484
2.5 F 4,071,480
4,071,481
17 R 4,071,485
18 N 4,071,486
22 CB 4,071,489
22 M 4,071,514
22 TN 4,071,487
23 XA 4,071,490
23.7 A 4,071,488
28.5 B 4,071,491
31.8 R 4,071,492
42.13 4,071,493
42.14 4,071,494
42.18 4,071,495
42.36 4,071,496
45.85 B 4,071,497
46.5 G 4,071,498
47 C 4,071,499
47 ET 4,071,500
67 R 4,071,501
75 EP 4,071,504
75 N 4,071,503
75 T 4,071,502
77.5 MA 4,071,505
78 A 4,071,506
78.3 R 4,071,507
79 4,071,509
79.3 MU 4,071,508
112.5 R 4,071,510
4,071,511
239 A 4,071,512
4,071,513
239.5 4,071,515
251 QB 4,071,516
253 4,071,517
256.4 C 4,071,519
256.4 R 4,071,518
287 K 4,071,520
290 HL 4,071,521
292 4,071,522
293.76 4,071,523
293.77 4,071,524
295 AM 4,071,525
299 4,071,526
306.5 4,071,527
306.7 C 4,071,529
306.7 T 4,071,528
326.45 4,071,530
327 P 4,071,531
332.5 4,071,533
343.7 4,071,534
345.1 4,071,535
345.8 R 4,071,536
345.9 R 4,071,538
345.9 S 4,071,537
346.75 4,071,539
346.76 4,071,540
348.25 4,071,541
348.48 4,071,542
401 4,071,543
410.7 4,071,544
429.7 4,071,545
448.2 N 4,071,546
456 R 4,071,547
462 R 4,071,548
465.4 4,071,550
465.8 R 4,071,549
501.15 4,071,551
501.17 4,071,552
514 J 4,071,553
558 H 4,071,554
564 RF 4,071,556
566 A 4,071,555
570 AB 4,071,557
570 D 4,071,558
570.7 4,071,559
584 R 4,071,560
586 P 4,071,561
600 R 4,071,562
601 R 4,071,563
613 D 4,071,564
614 A 4,071,567
615 R 4,071,568
619 R 4,071,565
621 C 4,071,569
621 D 4,071,566
649 F 4,071,570
654 R 4,071,571
659 A 4,071,572
668 R 4,071,573
676 R 4,071,574
677 R 4,071,575
683.47 4,071,576
827 4,071,577
850 4,071,578
866 4,071,579
878 R 4,071,580
4,071,581
4,071,582
927 R 4,071,583
932 4,071,584

CLASS 261

36 A 4,071,585
62 4,071,586

CLASS 264

.5 4,071,587
15 4,071,588
22 4,071,589
45.1 4,071,590
45.3 4,071,591
54 4,071,592
62 4,071,593
63 4,071,594
66 4,071,595
168 4,071,596
230 4,071,597
295 4,071,598
311 4,071,599
328 4,071,532

CLASS 266

51 4,071,227
162 4,071,228
173 4,071,229
193 4,071,230

CLASS 269

325 4,071,231

CLASS 271

8 R 4,071,232
4,071,233
11 4,071,234

CLASS 272

70.1 4,071,243
73 4,071,235
116 4,071,236

CLASS 273

1 R 4,071,237

1.5 R 4,071,238
29 A 4,071,239
49 4,071,240
55 B 4,071,241
61 R 4,071,242
143 R 4,071,246
155 4,071,248
161 4,071,249
185 C 4,071,250
186 R 4,071,251
243 GA 4,071,245
275 4,071,244
308 4,071,247

CLASS 274

39 R 4,071,252

CLASS 277

3 4,071,253
4,071,254
57 4,071,255

CLASS 280

11.28 4,071,256
63 4,071,257
79.2 4,071,258
95 R 4,071,259
166 4,071,260
220 4,071,261
479 A 4,071,262
508 4,071,263
610 4,071,264

CLASS 285

14 4,071,266
64 4,071,267
95 4,071,268
158 4,071,265
165 4,071,269

CLASS 292

169.22 4,071,270
201 4,071,271
246 4,071,129

CLASS 294

1 CA 4,071,272

CLASS 296

28 R 4,071,273
35 A 4,071,274

CLASS 297

85 4,071,275
4,071,276

CLASS 298

22 P 4,071,277

CLASS 299

5 4,071,278

CLASS 301

63 PW 4,071,279
65 4,071,280

CLASS 303

24 A 4,071,281
63 4,071,284
106 4,071,282
114 4,071,283

CLASS 307

141 4,071,773
215 4,071,774
221 D 4,071,775
228 4,071,776
229 4,071,777
4,071,778
255 4,071,779
262 4,071,780
265 4,071,781
268 4,071,782
270 4,071,783
279 4,071,784

CLASS 308

4 A 4,071,285

CLASS 310

42 4,071,787
4,071,788
50 4,071,789
59 4,071,790
4,071,791
70 R 4,071,792
71 4,071,793
154 4,071,794
219 4,071,795
236 4,071,796
331 4,071,785
361 4,071,786
4,071,797

CLASS 312

330 R 4,071,286

CLASS 313

18 4,071,798
44 4,071,799
123 4,071,800
154 4,071,801
209 4,071,802
409 4,071,803

CLASS 315

39.71 4,071,804
84 4,071,805
150 4,071,806
219 4,071,807
241 R 4,071,808
312 4,071,809
400 4,071,810

CLASS 316

19 4,071,287
4,071,288

CLASS 318

16 4,071,811

CLASS 323

8 4,071,813
75 B 4,071,814

CLASS 324

8 4,071,815
30 B 4,071,816
30 R 4,071,817
58 B 4,071,819
61 R 4,071,820
83 R 4,071,821
111 4,071,822
123 R 4,071,823
127 4,071,824
208 4,071,818

CLASS 325

38 B 4,071,825
39 4,071,826
42 4,071,827
65 4,071,828

CLASS 329

122 4,071,829

CLASS 330

4.3 4,071,831
107 Re.29,529
277 4,071,830

CLASS 331

117 R 4,071,832

CLASS 333

33 4,071,833
95 R 4,071,834

CLASS 335

133 4,071,835
195 4,071,836

CLASS 337

268 4,071,837

CLASS 338

47 4,071,838

CLASS 339

17 F 4,071,289
258 F 4,071,290

CLASS 340

53 4,071,839
166.5 4,071,840
347 AD 4,071,842

CLASS 343

5 CD 4,071,843
17.2 R 4,071,844
113 R 4,071,845
700 MS 4,071,846
761 4,071,847
844 4,071,848

CLASS 346

1 4,071,849

CLASS 350

3.5 4,071,291
128 4,071,292

CLASS 351

160 4,071,293

CLASS 352

72 4,071,294

CLASS 354

196 4,071,850
354 4,071,851

CLASS 355

3 SH 4,071,295
15 4,071,296

CLASS 356

4 4,071,297
73 4,071,298
202 4,071,299

CLASS 357

13 4,071,852

CLASS 358

41 4,071,853
128 4,071,854
260 4,071,855

CLASS 360

73 4,071,856
92 4,071,857
93 4,071,858
96 4,071,859
4,071,860
4,071,861
97 4,071,862
101 4,071,863
103 4,071,864
105 4,071,865
106 4,071,866
109 4,071,867
113 4,071,868
135 4,071,869

CLASS 361

21 4,071,870
27 4,071,871
56 4,071,872
64 4,071,873
94 4,071,874
113 4,071,875
119 4,071,876
152 4,071,877
245 4,071,879
307 4,071,878
309 4,071,880
320 4,071,881
333 4,071,882

CLASS 362

19 4,071,748
20 4,071,749
97 4,071,883
127 4,071,747
217 4,071,750

CLASS 363

21 4,071,884
64 4,071,885
80 4,071,812

CLASS 364

104 4,071,745
105 4,071,744
118 4,071,886
200 4,071,887
4,071,888
4,071,889
4,071,890
416 4,071,891
424 4,071,892
427 4,071,893
430 4,071,894
449 4,071,895
471 4,071,896
494 4,071,897
551 4,071,898
561 4,071,899
600 4,071,900
605 4,071,901
716 4,071,902
728 4,071,903
757 4,071,904
784 4,071,905
819 4,071,906
822 4,071,907
900 4,071,908
4,071,909
4,071,910
4,071,911

CLASS 365

65 4,071,841
122 Re.29,530

CLASS 366

64 4,071,226
114 4,071,225
172 4,071,167

CLASS 401

175 4,071,300

CLASS 403

231 4,071,301

CLASS 404

12 4,071,302

CLASS 415

112 4,071,303

CLASS 417

236 4,070,725
334 4,071,305

CLASS 418

82 4,071,306

CLASS 423

213.7 4,071,600
239 4,071,601
243 4,071,602
320 4,071,603
445 4,071,604
462 4,071,605
569 4,071,606
574 R 4,071,607
579 4,071,608
622 4,071,609
634 4,071,610
658.5 4,071,611
659 4,071,612

CLASS 424

1 4,071,613
49 4,071,614
52 4,071,615
76 4,071,616
78 4,071,617
89 4,071,618
90 4,071,619
175 4,071,620
177 4,071,621
4,071,622
238 4,071,623
4,071,624
4,071,625
241 4,071,626
246 4,071,627
249 4,071,628
251 4,071,629
256 4,071,630
263 4,071,631
4,071,632
324 4,071,633

CLASS 425

72 R 4,071,307
284 4,071,308

CLASS 426

264 4,071,635
604 4,071,634

CLASS 427

2 4,071,636
12 4,071,637
156 4,071,639
185 4,071,304
192 4,071,638
215 4,071,640
234 4,071,641
243 4,071,642
292 4,071,643
302 4,071,644
340 4,071,645
358 4,071,646

CLASS 428

102 4,071,647
212 4,071,648
215 4,071,649
260 4,071,650
284 4,071,651
323 4,071,652
332 4,071,653
336 4,071,654
403 4,071,655
555 4,071,658
626 4,071,656
646 4,071,657
677 4,071,659

CLASS 429

15 4,071,660
49 4,071,661
178 4,071,662
181 4,071,663
194 4,071,664
197 4,071,665

CLASS 432

14 4,071,309
106 4,071,310
234 4,071,311

CLASS 526

1 4,071,666
11.1 4,071,667
4,071,668
47.3 4,071,669
88 4,071,670
89 4,071,671
122 4,071,672
123 4,071,673
125 4,071,674
193 4,071,675
231 4,071,677
283 4,071,676
328 4,071,678
338 4,071,679

CLASS 536

23 4,071,680

CLASS 542

420 4,071,681

CLASS 544

21 4,071,682
28 4,071,683
182 4,071,684

CLASS 548

312 4,071,685

CLASS 560

35 4,071,686

CLASSIFICATION OF DESIGNS

D1— 23 247,071
D2— 224 247,072
308 247,073
322 247,074
D4— 12 247,075
35 247,076
D6— 91 247,077
106 247,078
172 247,079
177 247,080
186 247,081
192 247,082
247,083
247 247,084
257 247,085
D7— 137 247,086
194 247,087
202 247,088
247,089
247,090
D8— 11 247,091
D9— 66 247,092
116 247,093
129 247,094
157 247,095
247,096
172 247,097
208 247,098
D10— 56 247,099
78 247,100
D11— 4 247,101
5 247,102
12 247,103
131 247,104
144 247,105
147 247,106
D12— 146 247,107
147 247,108
148 247,109
155 247,110
247,111
247,112
158 247,113
D13— 35 247,114
D14— 13 247,115
46 247,116
D15— 52 247,117
199 247,118
D19— 59 247,119
D23— 77 247,120
D27— 03 247,121
42 247,122
D28— 86 247,123
D30— 16 247,124
D34— 2 R 247,125
247,126
3 247,127
4 A 247,128
4 R 247,129
5 SS 247,130
5 ST 247,131
15 AJ 247,132
15 R 247,133
D52— 2 A 247,134
D87— 1 D 247,135

CLASSIFICATION OF PLANTS

P.— 68 4,202
4,203
4,204
4,205

GEOGRAPHICAL INDEX

OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alebama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1 : 4,070,791
4,070,819
4,071,407
2 : 4,071,488
4 : 4,070,988
4,071,022
4,071,397
4,071,521
4,071,611
4,071,830
4,071,887
4,071,904
5 : 4,070,775
4,071,060
6 : Re.29,529
4,070,714
4,070,715
4,070,718
4,070,719
4,070,724
4,070,745
4,070,746
4,070,754
4,070,757
4,070,785
4,070,788
4,070,789
4,070,792
4,070,803
4,070,821
4,070,847
4,070,849
4,070,898
4,070,904
4,070,943
4,070,959
4,070,963
4,070,980
4,070,994
4,070,998
4,071,000
4,071,012
4,071,017
4,071,021
4,071,030
4,071,032
4,071,044
4,071,061
4,071,065
4,071,085
4,071,117
4,071,148
4,071,152
4,071,154
4,071,155
4,071,170
4,071,177
4,071,185
4,071,226
4,071,233
4,071,237
4,071,238
4,071,243
4,071,244
4,071,249
4,071,256
4,071,272
4,071,280
4,071,286
4,071,298
4,071,308
4,071,334
4,071,338
4,071,368
4,071,386
4,071,415
4,071,423
4,071,432
4,071,436
4,071,442
4,071,486
4,071,508
4,071,540
4,071,545
4,071,556
4,071,578
4,071,587
4,071,599
4,071,617
4,071,648
4,071,677
4,071,697
4,071,698
4,071,703
4,071,704
4,071,705
4,071,710
4,071,761
4,071,782
4,071,801
4,071,808
4,071,813
4,071,814
4,071,832
4,071,833
4,071,838
4,071,846
4,071,847
4,071,855
4,071,864
8 : 4,070,888
4,071,192
4,071,357
4,071,460
4,071,869
9 : 4,070,770
4,071,104
4,071,172
4,071,173
4,071,196
4,071,231
4,071,250
4,071,270
4,071,330
4,071,343
4,071,359
4,071,430
4,071,583
4,071,605
4,071,639
4,071,655
4,071,675
4,071,688
4,071,742
4,071,818
4,071,850
4,071,857
06 : 4,071,826
10 : 4,070,862
4,071,276
4,071,665
4,071,881
12 : 4,070,782
4,070,824
4,070,861
4,071,007
4,071,047
4,071,110
4,071,114
4,071,115
4,071,132
4,071,549
4,071,752
4,071,829
4,071,872
13 : 4,070,793
4,071,200
4,071,209
4,071,479
15 : 4,070,971
17 : Re.29,527
4,070,729
4,070,733
4,070,737
4,070,774
4,070,777
4,070,794
4,070,807
4,070,839
4,070,845
4,070,850
4,070,867
4,070,870
4,070,916
4,070,924
4,070,926
4,070,930
4,070,940
4,070,967
4,071,009
4,071,010
4,071,026
4,071,027
4,071,033
4,071,063
4,071,090
4,071,091
4,071,106
4,071,107
4,071,122
4,071,129
4,071,131
4,071,165
4,071,168
4,071,176
4,071,186
4,071,197
4,071,218
4,071,246
4,071,247
4,071,259
4,071,263
4,071,277
4,071,282
4,071,302
4,071,348
4,071,360
4,071,447
4,071,469
4,071,595
4,071,622
4,071,696
4,071,699
4,071,709
4,071,719
4,071,720
4,071,747
4,071,780
4,071,811
4,071,911
18 : 4,070,728
4,070,752
4,070,927
4,070,990
4,071,111
4,071,118
4,071,137
4,071,235
4,071,317
4,071,318
4,071,321
4,071,444
4,071,520
4,071,598
4,071,718
4,071,738
4,071,739
4,071,773
4,071,788
4,071,805
19 : 4,071,071
4,071,136
4,071,159
4,071,673
4,071,836
4,071,901
20 : 4,070,864
4,071,125
4,071,245
4,071,438
4,071,877
21 : 4,070,717
4,070,722
4,071,891
22 : 4,070,786
4,070,869
4,071,014
4,071,501
4,071,576
23 : 4,070,841
4,071,740
24 : 4,070,744
4,070,856
4,070,879
4,070,890
4,070,982
4,070,992
4,071,031
4,071,066
4,071,268
4,071,269
4,071,691
4,071,768
4,071,806
4,071,844
4,071,895
4,071,896
25 : 4,070,725
4,070,735
4,070,741
4,070,748
4,070,769
4,070,778
4,070,851
4,070,863
4,070,889
4,070,902
4,070,933
4,070,960
4,070,978
4,071,163
4,071,171
4,071,198
4,071,255
4,071,294
4,071,366
4,071,542
4,071,640
4,071,659
4,071,664
4,071,706
4,071,737
4,071,741
4,071,753
4,071,820
4,071,824
4,071,845
4,071,851
4,071,871
4,071,875

4,071,879
4,071,890
26 : 4,070,806
4,070,840
4,070,858
4,070,887
4,070,891
4,070,909
4,070,972
4,070,973
4,071,029
4,071,078
4,071,112
4,071,119
4,071,139
4,071,146
4,071,167
4,071,187
4,071,204
4,071,252
4,071,261
4,071,274
4,071,289
4,071,328
4,071,336
4,071,337
4,071,371
4,071,400
4,071,463
4,071,485
4,071,498
4,071,546
4,071,547
4,071,577
4,071,600
4,071,660
4,071,666
4,071,684
4,071,736
4,071,866
27 : 4,070,725
4,070,783
4,070,831
4,071,195
4,071,467
4,071,524
4,071,635
4,071,652
4,071,694
28 : 4,071,258
29 : 4,070,787
4,070,802
4,070,906
4,070,953
4,071,380
4,071,427
4,071,429
4,071,464
4,071,584
4,071,594
4,071,608
4,071,746
30 : 4,070,932
4,071,349
4,071,350
4,071,351
4,071,352
4,071,353
31 : 4,070,832
4,071,265
32 : 4,070,844
4,071,473
33 : 4,071,862
34 : 4,070,767
4,070,961
4,070,993

4,070,995
4,071,034
4,071,102
4,071,144
4,071,150
4,071,211
4,071,288
4,071,290
4,071,319
4,071,333
4,071,394
4,071,417
4,071,425
4,071,426
4,071,465
4,071,478
4,071,494
4,071,499
4,071,503
4,071,516
4,071,522
4,071,529
4,071,535
4,071,537
4,071,538
4,071,571
4,071,574
4,071,606
4,071,615
4,071,626
4,071,628
4,071,631
4,071,668
4,071,671
4,071,680
4,071,682
4,071,695
4,071,708
4,071,722
4,071,776
4,071,777
4,071,819
4,071,825
4,071,831
4,071,842
4,071,848
4,071,852
4,071,888
4,071,897
4,071,908
35 : 4,071,080
4,071,744
4,071,910
36 : 4,070,716
4,070,750
4,070,756
4,070,760
4,070,761
4,070,768
4,070,790
4,070,820
4,070,823
4,070,830
4,070,843
4,070,880
4,070,882
4,070,931
4,070,951
4,070,975
4,071,037
4,071,038
4,071,075
4,071,082
4,071,092

4,071,140
4,071,142
4,071,151
4,071,169
4,071,179
4,071,214
4,071,216
4,071,236
4,071,240
4,071,248
4,071,257
4,071,260
4,071,267
4,071,287
4,071,316
4,071,323
4,071,363
4,071,374
4,071,376
4,071,378
4,071,385
4,071,396
4,071,399
4,071,403
4,071,409
4,071,451
4,071,461
4,071,476
4,071,477
4,071,497
4,071,500
4,071,513
4,071,514
4,071,557
4,071,560
4,071,572
4,071,573
4,071,582
4,071,597
4,071,609
4,071,614
4,071,632
4,071,644
4,071,646
4,071,662
4,071,663
4,071,670
4,071,735
4,071,748
4,071,749
4,071,764
4,071,783
4,071,787
4,071,790
4,071,791
4,071,798
4,071,799
4,071,802
4,071,812
4,071,828
4,071,839
4,071,878
4,071,880
4,071,902
37 : 4,070,720
4,070,773
4,070,896
4,071,275
4,071,729
38 : 4,070,810
4,071,266
39 : 4,070,726
4,070,731
4,070,734
4,070,801

4,070,826
4,070,827
4,070,834
4,070,857
4,070,859
4,070,866
4,070,876
4,070,910
4,070,920
4,070,929
4,070,939
4,070,946
4,070,947
4,070,974
4,070,991
4,071,015
4,071,016
4,071,036
4,071,040
4,071,062
4,071,068
4,071,153
4,071,183
4,071,184
4,071,193
4,071,194
4,071,279
4,071,283
4,071,301
4,071,325
4,071,326
4,071,327
4,071,344
4,071,367
4,071,382
4,071,482
4,071,483
4,071,492
4,071,504
4,071,554
4,071,565
4,071,613
4,071,624
4,071,625
4,071,638
4,071,656
4,071,669
4,071,725
4,071,769
4,071,771
4,071,794
4,071,796
4,071,835
4,071,885
40 : 4,070,865
4,070,913
4,070,979
4,070,989
4,071,011
4,071,013
4,071,028
4,071,035
4,071,331
4,071,395
4,071,433
4,071,434
4,071,457
4,071,471
4,071,496
4,071,509
4,071,566
4,071,679
4,071,756
41 : 4,070,836

4,071,124
4,071,141
4,071,160
42 : Re.29,528
4,070,721
4,070,730
4,070,742
4,070,751
4,070,755
4,070,780
4,070,855
4,070,912
4,070,956
4,070,983
4,070,987
4,071,018
4,071,020
4,071,023
4,071,059
4,071,156
4,071,182
4,071,201
4,071,207
4,071,213
4,071,215
4,071,217
4,071,219
4,071,224
4,071,254
4,071,293
4,071,300
4,071,306
4,071,312
4,071,324
4,071,339
4,071,340
4,071,341
4,071,342
4,071,355
4,071,370
4,071,381
4,071,402
4,071,403
4,071,420
4,071,428
4,071,439
4,071,446
4,071,489
4,071,518
4,071,570
4,071,586
4,071,588
4,071,592
4,071,593
4,071,620
4,071,658
4,071,661
4,071,678
4,071,727
4,071,733
4,071,816
4,071,817
4,071,898
4,071,907
44 : 4,071,178
4,071,212
4,071,884
45 : 4,070,747
4,071,049
4,071,138
4,071,596
47 : 4,070,848
4,071,562
4,071,689

4,071,743
48 : Re.29,526
4,070,713
4,070,937
4,070,954
4,070,958
4,070,981
4,071,019
4,071,041
4,071,043
4,071,045
4,071,046
4,071,084
4,071,086
4,071,088
4,071,096
4,071,099
4,071,101
4,071,145
4,071,175
4,071,203
4,071,206
4,071,278
4,071,285
4,071,435
4,071,458
4,071,470
4,071,539
4,071,558
4,071,602
4,071,604
4,071,650
4,071,700
4,071,745
4,071,754
4,071,755
4,071,757
4,071,775
4,071,815
4,071,906
49 : 4,071,143
51 : 4,070,763
4,070,860
4,071,190
4,071,262
4,071,392
53 : 4,070,853
4,070,908
4,071,098
4,071,189
4,071,208
4,071,239
4,071,389
4,071,821
54 : 4,071,627
55 : 4,070,764
4,070,852
4,070,914
4,070,962
4,070,969
4,070,984
4,071,002
4,071,004
4,071,147
4,071,205
4,071,251
4,071,398
4,071,491
4,071,533
4,071,616
4,071,645
4,071,767
4,071,789
56 : 4,070,833

DESIGN PATENTS

6 : 247,073
247,074
247,077
247,083
247,091
247,099
247,100
247,110
247,111

247,112
247,120
247,125
247,129
247,133
9 : 247,086
11 : 247,104
12 : 247,114
247,116

247,126
13 : 247,081
247,085
247,118
17 : 247,078
247,127
247,130
18 : 247,076
247,115

19 : 247,124
24 : 247,121
29 : 247,087
34 : 247,071
247,128
36 : 247,101
247,102
37 : 247,082
39 : 247,095

247,096
247,105
247,113
41 : 247,131
42 : 247,088
247,089
247,090
247,093

247,106
44 : 247,084
247,103
45 : 247,094
247,108
51 : 247,092
53 : 247,123
247,132

PLANT PATENTS

39 : 4,202

4,203

4,204

4,205

U. S. GOVERNMENT PRINTING OFFICE : O - 1978

CHANGE OF ADDRESS FORM

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

PLEASE PRINT OR TYPE

(or) COUNTRY

Mail this form to: NEW ADDRESS

Superintendent of Documents
Government Printing Office SSOM
Washington, D.C. 20402

Attach last subscription label here.

SUBSCRIPTION ORDER FORM

SUBSCRIPTION ORDER FORM

ENTER MY SUBSCRIPTION TO:

@ $ Domestic; @ $ Foreign.

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

PLEASE PRINT OR TYPE

(or) COUNTRY

☐ Remittance Enclosed (Make checks payable to Superintendent of Documents)

☐ Charge to my Deposit Account No. .....

MAIL ORDER FORM TO:
Superintendent of Documents
Government Printing Office
Washington, D.C. 20402

CHANGE OF ADDRESS FORM

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY

STATE

ZIP CODE

(for) COUNTRY

PLEASE PRINT OR TYPE

Mail this form to: NEW ADDRESS

Superintendent of Documents
Government Printing Office SSOM
Washington, D.C. 20402

Attach last subscription label here.

SUBSCRIPTION ORDER FORM

ENTER MY SUBSCRIPTION TO

☐ $ Domestic; ☐ $ Foreign.

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY

STATE

ZIP CODE

(for) COUNTRY

PLEASE PRINT OR TYPE

☐ Publications Enclosed (Make checks payable to Superintendent of Documents)

☐ Charge to my Deposit Account No.

MAIL ORDER FORM TO:
Superintendent of Documents
Government Printing Office
Washington, D.C. 20402

U.S. DEPARTMENT OF COMMERCE
Juanita M. Kreps, Secretary
PATENT AND TRADEMARK OFFICE
Lutrelle F. Parker, Assistant Secretary and Commissioner